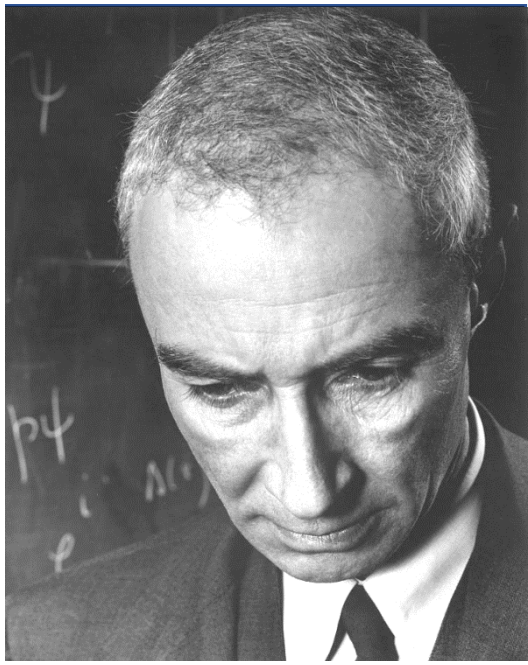
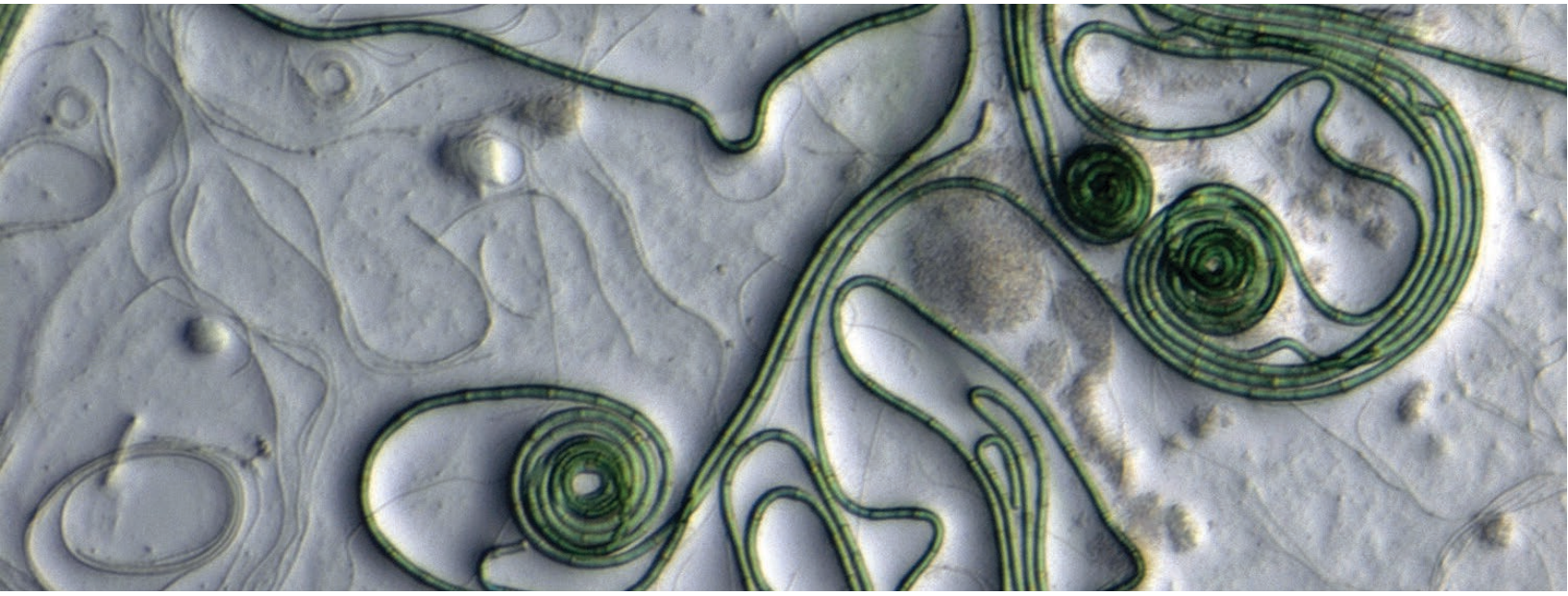
OPPENHEIMER SCIENCE AND ENERGY LEADERSHIP PROGRAM

LEADERSHIP, INNOVATION, EXCELLENCE

OSELP Cohort 5
Think-Piece Report
December 2022





About the Oppenheimer Science and Energy Leadership Program

OSELP is the premier leadership development program of the National Laboratory Directors' Council. The program exposes emerging leaders to the singular breadth, diversity, and complexity of the National Labs and their partners in government, industry, and academia.

For more information on the Oppenheimer Program, please visit the website at www.oselp.org.

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Revised 12.20.2022

Cover image: Dr. J. Robert Oppenheimer, National Museum of American History, 1958. Website source: https://www.si.edu/object/dr-j-robert-oppenheimer:nmah_1414376.

Think-Piece Report, OSELP Cohort 5

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Introduction

This report presents the think-piece contributions of the fifth Oppenheimer Cohort. With members hailing from all 17 National Labs, fellows in the fifth cohort represent a rich diversity of perspectives, experiences, and professional backgrounds.

Three major themes serve as the organizing principles for the 10 think-pieces in this report. The first four think-pieces address issues related to Awareness and Identity of the National Labs. A cross-cutting thread in each of these think-pieces is the recognition that despite their singular contribution to science and technology innovation, national security, and U.S. economic competitiveness, the National Labs are not generally well-known or well-understood by the public or early-career staff. These think-pieces offer recommendations to enhance the ability of the National Labs and DOE to communicate the extraordinary value of these institutions to key stakeholder groups.

Think-Piece Organizing Themes

Awareness and Identity of the National Labs

- Identity and Awareness of the National Labs
- National Lab Conference
- ENDLESS Frontiers: A Journal for the National Labs
- National Laboratories Explorers Program

People

- The National Labs' Talent Opportunity Pool Database
- System Innovations in Benefits
- Ensuring a Diverse, Equitable, & Inclusive Operations & Research Culture Across the National Lab Complex

System Coordination & Enabling Initiatives

- Innovation for Global Security
- Accelerating Innovation Through Multi-Lab LDRD Investments
- Overcoming Barriers for a Modern, Net Zero Carbon National Laboratory Infrastructure

The theme of People is taken up by the next three think-pieces. These think-pieces address many of the foundational challenges faced by all the National Labs in recruiting, retaining, and developing diverse talent in an increasingly competitive workforce environment. These think-pieces provide recommendations to advance the ability of the National Labs to effectively recruit and retain diverse talent across mission domains while fostering a system-wide workplace culture that supports diversity, equity, inclusion, and accessibility.

The final three think-pieces focus on the theme of System Coordination and Enabling Initiatives. While acknowledging that each of the National Labs possess unique capabilities and mission priorities, these think-pieces offer recommendations that would coalesce these unique strengths to more effectively advance mission priorities, improve system-level strategic and tactical capabilities, and enhance mission delivery through infrastructure modernization.

A core goal of the Oppenheimer program is to encourage and enable fellows to think deeply about innovative ways to improve the DOE-National Lab system to ensure this extraordinary resource is prepared to meet the challenges of the future. These think-pieces represent the views and perspectives of the authors in their capacity as participants of the Oppenheimer program. The think-pieces do not represent the views of the National Labs or DOE.

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ed., 2022 Oppenheimer Think-Piece Report
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View Slides

Identity and Awareness of the National Labs

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Overview

"Most members of the public do not understand what the DOE National Laboratories do, or what a critical role they play in the nation's security and economic vitality. Those people who do know about the National Laboratories often are familiar with only a fraction of what they do, perhaps linked to one of the laboratories in their region."

– 2015 CRENEL Report

Some of the biggest challenges facing the National Labs are compounded by the fact that for the most part, the general public does not know what the National Labs are, what we do, or the impact the National Labs have on everyday lives. This lack of public awareness directly impacts the ability of the National Labs to overcome some of our most pressing challenges. These include attracting and retaining world-class talent, expanding partnerships with industry, and obtaining the long-term stability needed to address the world's biggest scientific and engineering challenges.

The US Department of Energy (DOE) has an established identity, name, reputation, and mission. It is currently undergoing a rebrand with a priority to raise the profile of the DOE, the Administration's goals, the Secretary's goals, and the fight against the climate crisis. However, the National Labs are often overlooked in these activities. As an example, the most recent recruitment commercial featuring Secretary Granholm and Robert Downey Jr. did not mention the National Lab complex, despite the fact that the purpose of the commercial was to entice people to work to solve climate change – which is predominantly happening at the National Labs.

Each Lab has a strong, individual identity, but who is responsible for advocating for the capabilities and interests of the National Labs as a complex? The National Laboratories are the country's best kept secret, but why? It is vital the Labs work together to increase awareness of our science and technology discoveries and their positive impacts on the nation. There are countless benefits, but most pressing, this is imperative to improving our recruitment pipeline.

This Think-Piece highlights the necessity to establish an identity for the National Labs and enhance awareness of them. This paper also discusses potential mechanisms and ongoing considerations to ensure that the identity and awareness is sustainable over time.

Process

As part of the Oppenheimer Fellowship, we had the opportunity to visit all of the National Labs, either physically or virtually, and hear firsthand how each communicates its story, vision, and contributions to national Interests. We also conducted a review of various documents on the history and current state of the National Lab system, including the 1958 Weinberg Memo, 2015 CRENEL Report, and 2020 State of the DOE National Laboratories Report.

Additionally, we met with the National Labs Communications Officers executive team, a representative from the Lab Operations Board, representatives from NASA's communications office, and two executives in the marketing and advertising industry.

Challenge

"The National Labs really are the crown jewels of not just the Department of Energy, but of the country's entire scientific enterprise."

– Jennifer Granholm, Secretary, DOE

Establishing a diverse talent pipeline, that is representative of the diversity of the United States, requires ensuring that the people of the United States are aware of the opportunities available at the National Labs. The general public and many in the technical community and even in government service are unaware of the National Labs. An imperative exists to create an identity and increase overall awareness to strengthen and raise the stature of all 17 National Labs. This common identity would not take away from the established identities of the individual Labs, but rather would amplify their visibility. The effort to enhance awareness of the National Labs will target everyone from the general public to international science communities to congressional representatives. This will also include outreach tailored for K-12 students who are key to our science future and solving the grand challenges of today and tomorrow.

Each Lab has an element, often unique, of community outreach. Although independent and unique efforts at the National Labs may be effective to the areas of outreach, these efforts may be amplified, reinforced and broadened by a cohesive National Lab identity and awareness strategy that operates at a national level. A combination of community outreach with National Lab identity/awareness could jointly increase potential career interest as well as public awareness of the National Labs.

Lack of awareness has been a known concern that many leaders in the complex and Oppenheimer cohorts have identified. In fact, the NLDC's establishment of the NationalLabs.org website attempted to address this lack of public awareness. Despite these and other efforts to improve the public's awareness of the National Labs' existence, the Lab complex remains relatively unknown to the public. We submit that the primary cause of this issue is that a unified National Labs identity does not exist, in large part because there is no clear owner responsible for a collective identity.

One of our recommendations addresses this issue of ownership.

Another major hurdle to the development of a unified National Lab identity has been that it would detract from individual National Lab identities. However, there are many successful examples of overarching identities - analogous to this proposal - that illustrate the amplification of individual entities without loss of the uniqueness of the individual institutions/organizations:

- **Big 10**: The Big 10 is an NCAA Athletic Conference. When individuals are asked what they think of when they hear the Big 10, they typically begin listing the individual institutions that are a part of the conference (e.g., Wisconsin, Minnesota, Purdue). Each of the universities has its own mission, value proposition, programs, and culture. The Big 10 has been able to amplify the individual universities' identities. Each of the universities compete against one another athletically, but there is also a sense of shared support and cooperation. In addition, when a

university is added from a new region, the student pipeline for the other schools typically grows from an increased awareness in the new region.

- **National Academies**: The National Academies have partnered to create a joint identity. Each National Academy has its own scope and identity, and they work together to create an identity and release reports under the shared logo.
- **National Park Service**: There are 63 National Parks across the United States. Each park is unique, and the shared identity as a National Park effectively communicates a set of standards, expectations, and values.

In developing this Think-Piece, we had many discussions about the extent to which the National Labs' identity should be integrated with the DOE identity, particularly given DOE's current rebranding effort. Our conclusion is that the National Labs' identity must be complementary but distinct from DOE's identity, in the same way that the identities of the following federal institutions are all distinct from the departments to which they belong:

- Federal Bureau of Investigation (distinct identity from the Department of Justice)
- National Park Service (distinct identity from the Department of the Interior)
- Marine Corps (distinct identity from the Department of Defense)
- Peace Corps (distinct identity from the State Department)
- Centers for Disease Control and Prevention (distinct identity from the Department of Health and Human Services)
- United States Secret Service (distinct identity from the Department of Homeland Security)

Over the past six months, we have talked with many identity, advertising, and branding experts inside and outside of the Government space. What we have learned from those experts is the following:

An identity should convey vision, emotion, and intent. It should be simple, direct, and encompassing. It should be aspirational or inspiring.

Once the National Labs establish a unified identity following that advice, and then raise awareness of that identity, many of our challenges will be easier to overcome. An identity that captures the hearts and minds of the public, from schoolchildren to taxpayers and voters of all ages, will increase support for the National Labs and dramatically improve our recruiting pipeline.

Recommendations

The National Lab Director's Council should support the establishment of a unified identity for the National Labs and a sustained, intentional commitment to building awareness of the National Labs. This identity should be developed and maintained independently of both the DOE brand and any of the individual National Lab identities. It should complement both the work of the DOE and the work of the individual labs.

For this identity-building effort to be successful, centralized oversight and ownership are essential. According to marketing experts, the most successful identities are ones that communicate with a single voice and a simple vision. A contributing factor to why previous efforts to build awareness of the National Labs may have been unsuccessful is the lack of clearly defined ownership of the National Lab identity who has been empowered to communicate in a simple, straightforward manner.

A number of candidates could potentially own, build, and sustain a National Lab identity and awareness campaign. These include the following:

- The Foundation for Energy Security and Innovation (FESI)
- The Oppenheimer Leadership Network
- The National Labs Directors Council
- The DOE
- The National Labs Chief Communications Officers Council
- A volunteer National Lab or rotating lab assignment
- A newly established entity founded for the purpose of promoting a National Lab identity

Each of these options has its advantages and disadvantages, which are documented in the table below.

After carefully weighing the potential options, we recommend the FESI as the best pathway forward. It removes the burden of any individual lab or group having to be responsible for the ongoing identity and awareness campaign. Since FESI is still being formed, an opportunity exists to ensure lab engagement in the shaping of the specific responsibilities of FESI.

We recommend that the National Lab Director's Council take the following actions:

- Charter this OSELP team for further development of the idea with a follow-up presentation at the NLDC Summer Retreat. The development will include facilitating workshops, developing a value statement in collaboration with the Oppenheimer Leadership Network, and exploring consultants to partner with on developing an awareness campaign plan.
- Advocate for the inclusion of a National Labs Identity and Awareness Building Campaign within the scope of the activities of FESI. If FESI does not come to fruition, fully support selecting one of the other six pathways.

The National Labs have an opportunity to expose "the best kept secret" and ensure future generations understand the remarkable, impactful work being done within the National Labs. With the NLDC's commitment, we look forward to when people of all ages will know the opportunities, purpose, and identity of the National Labs.

Potential National Laboratory Identity Owner	Advantages	Disadvantages
The National Labs Directors Council	• Proximity to mission • Existing group • Previous effort in this area	• Limited capacity to take on an identity/awareness effort • Limited unrestricted funding • Not an incorporated entity
The DOE	• Funding availability • Own existing lab brands • Ongoing rebranding effort	• National Labs identity would be secondary objective to DOE identity • Lack of significant progress to date • DOE is relatively unknown to public

The National Labs Communications Officers Group	• Proximity to mission • Communications expertise	• Lack of time/capacity • Limited unrestricted funding • National Labs identity would be secondary objective to individual lab identity
A Volunteer Lab or Lab Rotation	• Proximity to mission • Communications expertise	• Lack of time/capacity • Limited unrestricted funding • National Labs identity would be secondary objective to individual lab identity • Support susceptible to changes in lab leadership • Messaging may be influenced by individual lab mission • Administrative burden of soliciting funding from other labs
A New National Labs Foundation	• Proximity to mission • No unallowable funding restrictions • Ability to solicit external funding	• Administrative overhead of establishing and funding a new non-profit entity • Permissions to use lab names or identities may be difficult
The Oppenheimer Leadership Network	• Proximity to mission	• Reliance on volunteers would affect sustainability • Limited unrestricted funding • Lack of time/capacity • Mass communications expertise limited • Lack of empowerment to create a messaging strategy
Foundation for Energy Security and Innovation (FESI)	○ No unallowable funding restrictions ○ Ability to solicit external funding ○ Foundation being established ○ Mass communications available for purchase	• Lack of direct proximity to lab mission • Mission of FESI is related to building awareness of the National Labs, but not a perfect mission fit

View Slides

National Lab Conference

Mei Bai (SLAC), Ian Cloët (ANL), Sydni Credle (NETL), Thomas Yong Han (LLNL), and Robert Wagner (ORNL)

Executive Summary

We propose a National Lab Conference as a mechanism to bring the broad benefits of the Oppenheimer Science and Energy Leadership Program to all staff at the 17 National Laboratories. Broadly speaking, these benefits include: encouraging staff to think big and develop ideas in science, technology, and operations that can greatly increase the impact of the National Labs; increase networking and collaboration opportunities between all 17 National Labs; and greatly accelerate the development of a deeper understanding of National Lab culture and operations, so that the tremendous opportunities provided by the National Lab complex can be more fully comprehended and harnessed. To achieve this, we propose a novel structure for the National Lab Conference centered around “Idea Booths” reminiscent of a trade show, where participants can share and discuss their ideas in science, technology, and operations. The conference will have a focus on engaging early/mid-career staff, and the best ideas from the booths will be decided by an anonymous vote from attendees, where the teams behind these ideas will be invited to give plenary presentations which will close the conference. A draft program for a pilot NLC can be found in Appendix A, and a mock-up program guide in Appendix B provides an example of the NLC program for attendees.

Introduction and Motivation

The leadership and career development opportunities provided by the Oppenheimer Science and Energy Leadership Program (OSELP) are truly inspirational. The knowledge and insights gained through OSELP empowers cohort members to reimagine and expand a vision for the National Lab (NL) system and their roles within it. This program provides avenues for participants to build connections across the 17 NLs, to share and develop ideas that can improve all aspects of the NLs, and to increase their impact on scientific discovery, technology, and national security. The goal of our think-piece is to develop a framework that would bring the broad opportunities and benefits of OSELP to all staff and student members of the NLs, with a particular emphasis on early and mid-career members. Our proposed solution to this challenge is an annual or biennial National Lab Conference (NLC).

The NLC would be focused on the science, technology, and operations of the NL complex, that would serve as an open forum and meeting place to enable: 1) The organic generation and vetting of the new ideas and concepts that could increase the impact and improve operations of the NLs, and help build meaningful collaborations and initiatives across the NLs; 2) Showcase and increase awareness for the science and technology developed by the NLs; and, 3) Sharing of best practices for a wide variety of DOE challenge areas (technical and non-technical) across a broader NL audience. The NLC would place a special emphasis on empowering and facilitating early and mid-career NL staff to think big. It would achieve this by exposing NL staff to the tremendous opportunities provided by the NLs and then to provide a forum which empowers all NL staff to think beyond their group/division, and to present ideas that could have a transformational impact on any aspect of the NL system. This conference would have a “bottoms-up” or “grassroots” approach where early and mid-career staff would feel ownership of the event, by being involved in its planning, coordination, and implementation on a voluntary basis. A

successful annual or biennial NLC would help strengthen the laboratory system as a whole by encouraging and empowering NL staff to generate and present new ideas, and in doing so facilitate cross-Laboratory relationships and foster grassroot collaborations in cross-cutting fields and mission support organizations.

Because of the size and complexity of the NL system, together with the vast opportunities, there is a tremendous need for such a conference. For example, the learning curve associated with navigating the NL complex and being able to take full advantage of the tremendous opportunities, is most often steep and long for those staff members new to the NLs. This applies equally to scientific, technical, and operations staff at all levels. This steep learning curve often results in the siloing of expertise into smaller groups, and stifles creativity and broad collaborations across divisions and labs, which is needed to think big, cultivate the important questions, and then develop the new ideas that can have a transformational impact on NL science, technology, and operations.

Concepts that on the surface may appear similar to the NLC have been developed and implemented in the past, these include, the Big Ideas Summit series [1] and the InnovationXLab Summit series [2]. Both of these summit series involved participation from all 17 NLs, where the former provided opportunities for "senior leadership at Energy Department headquarters and the National Labs to work in partnership to address the nation's most important energy challenges" [1] and the latter endeavors to "expand the commercial impact of the substantial investment in the National Lab innovation portfolio" [2]. A common theme of these conferences, which is ubiquitous in the NL system, is a "top-down" approach, where participation is usually limited to a select few, such as senior leadership, and participants are often invited to just attend and listen, and then asked to take back the acquired knowledge to implement at their respective NLs. The NLC is a fundamentally different concept, it will be grassroots/bottoms-up and open to all, it will be structured to empower all members of the NL complex to bring and share their ideas. These ideas will be discussed and vetted by all participants. At its core, the NLC will be an ideas factory for the NLs, and a broad networking and collaboration opportunity, to help NLs improve all aspects of their operation and generate the next big ideas in science and technology.

NLC Format, Structure, and Organization

A key function and feature of the NLC is to be an inclusive factory for ideas and the building of collaborations across the NLs in the core missions of science, technology, and operations. This concept is key to the core vision for the NLC and developing the format for the conference that delivers on this vision has been an important focus. To achieve this vision for the NLC, well before each conference there would be an open call across all 17 NLs which would invite individuals, or teams, to submit brief "think-pieces" of around 500 words that outline an impactful idea for the NLs. These ideas could concern any aspect of the NL complex, from big ideas in science and technology, to improvements in operations and mission support, and any staff member or student at a NL would be welcome to submit a think-piece, either individually or as part of a team. These think-pieces would be submitted under broad categories, and the organizing committee would facilitate the vetting of these think-pieces and help select those that are appropriate for the NLC. An important mechanism for this initial vetting would be a crowd-sourced approach, where all think-pieces would appear online and NL members could up/down-vote the ideas they see as most important and impactful. Importantly, during this vetting process the authors of the think-pieces would be hidden/blinded. This process will create a level playing field of

ideas, where submissions from senior leadership and those new to the NLs will be judged purely on their merits. Once vetting is complete, the authors of the think-pieces would be unblinded and then there would be a full record of all think-pieces submitted.

We envision broad participation in the NLC, especially from early/mid-career staff, and would therefore hope to have a large number of think-pieces presented at the NLC, perhaps numbering in the hundreds once the conference is well established. In providing a platform for new ideas to be created, shared, and amplified, the NLC will place a strong emphasis on encouraging a high amount of open dialogue and interaction amongst participants. To facilitate this, we think the usual themed parallel session format is far from ideal. Instead, we plan to adopt and adapt a familiar concept from trade shows and large industry sponsored conferences and use the concept of free-standing booths where individuals and teams can present their ideas and have open discussion with other participants.

The use of booths as an "ideas showcase" does away with the formal structure of a conventional conference and leans into a more open, dynamic framework similar to an open exhibit hall that one would find at a trade show, where attendees are free to engage with the ideas they find most interesting. As far as we know, this is a completely novel concept for a conference of this type.

Another key feature of the NLC is a selection process to determine the best ideas presented in the booths. We plan to do this by providing participants the opportunity to vote, or provide a score, on the ideas they find most compelling. This could be achieved by using an app for the NLC or an online survey form. Because of the importance of this NLC as a mechanism for showcasing and identifying important ideas from all NL staff, we would like to see broad participation, including from lab leadership who would also be expected to vote on the ideas they find most impactful. The top-rated ideas in the various categories, e.g., science, technology, and operations, from both general attendees and lab leadership would then be given the opportunity to present these ideas in a plenary session that would close the NLC.

The NLC would also be much more than just the ideas booths, it would also provide additional opportunities for networking, have plenary presentations that highlight the science, technology, operations, and leadership of the NL system, and leave room for the spontaneous organization of participants in analogy to the Unconference concept [3]. To begin the NLC series we propose an initial pilot meeting, consisting of two half and one full day. A draft agenda and associated rationale are given in Appendix A.

Challenges for a Successful NLC

After a few years the NLC could become a very large event with over one thousand participants. The key challenge is therefore the large number of personnel needed to handle the planning, website, think-piece solicitation and processing, location and venue, funding and finances, speakers, advertising, travel, and all the other logistics needs for a large conference. We plan to include all science, technology, and operation aspects from all 17 NLs Labs, which means we will need an organizing committee with commensurate representation that will need to invest considerable time. Therefore, each Lab must be vested in the NLC at the highest levels.

Summary, Benefits, Impact, and Ask

A successful NLC series will have many important benefits to the NL complex. It will help build a NL identity and sense of belonging, especially for early/mid-career staff, it will help develop a NL brand, it will elevate important discussions, such as those around DEIA, to a level where all 17 NLs are engaging together at a grassroots level, it will help with staff recruitment and retention, it will facility broad collaboration with industry, and finally it will empower NL staff to build a bigger vision for their careers at the NLs, that more fully harnesses the tremendous resources and opportunities provided by the NL complex. This vision for the NLC will only be realized with the full support of the NLs. Considerable infrastructure will need to be developed and maintained, e.g., IT support will be needed to develop and maintain the web interface for the NLC so that the initial think-pieces can be submitted and vetted. Our ask is therefore full endorsement and support from the NLDC for an NLC.

Acknowledgments

We thank all OSELP cohort 5 members for a memorable year. The same sentiments hold for Kevin Doran and Sue Winters, whose shepherding and leadership of the program was a huge part of making it so special. Finally, we thank all the members of the NLs we meet during the visits, from the 17 Lab Directors to the event organizers, each of whom made the visits to each NL so informative, educational, and inspirational. All of these interactions helped shape the concept of an NLC.

References

[1] https://www.energy.gov/big-ideas-summit.

[2] https://www.energy.gov/technologytransitions/innovationxlab.

[3] https://en.wikipedia.org/wiki/Unconference.

NLC Appendix A: Draft Program for the Pilot NLC

Our expectation is that the NLC could develop into a flagship event for the NLs, and could grow to be of the size and duration of a typical large conference with perhaps thousands of participants. However, for a pilot NLC we propose a much smaller two/three-day event with perhaps 100 participants. Such a pilot event should help set the stage for a longstanding and enduring NLC, with the understanding that it will grow in subsequent years. For the pilot NLC we propose beginning the meeting in the afternoon on the first day, the second day would have a full schedule, and the third day would finish by noon. This means that for most participants only two nights accommodation are needed, and travel is completed over three days. A potential schedule is as follows:

Day 1 (afternoon) – Plenary Talks: It is envisioned that the NLC would begin with a series of compelling keynote speakers that would showcase the achievements and opportunities at the NLs. This may include: 1) Opening remarks from DOE leadership (e.g., the Secretary of Energy, Under Secretary's, etc.), as this event will provide a platform for DOE-wide announcements, dissemination of information, and to provide a vision for the coming years; 2) Lightning talks from Lab Directors, which could highlight recent achievements at the NLs and provide an overview of current and forthcoming priorities; 3) Inspiring presentations from scientific, technology, and operations leaders at the NLs that showcase the grand

challenges and achievements of the NLs. In addition, there could be guest speakers on specific topics that are of interest to the NLs, which could be from universities, international organizations such as the IPCC, and other prominent leaders in important fields. 4) Awards and Recognition, as this annual/biennial event may be used to acknowledge the efforts of NL staff for outstanding R&D, service, etc. This plenary session should be both informative and inspirational for participants and help inspire attendees to take full advantage of opportunities provided by the NL system and empower them to do so.

Day 1 (afterhours social programs): Early/Mid-career meet NL Directors

Day 2 (morning) – Two Idea Booth sessions: As described, the NLC will not follow the traditional conference framework that relies on rigid "tracks and sessions" but instead replaces it with an open exhibit hall or trade show structure where new ideas are presented and engaged with via "Idea Booths." In doing so, the NLC will encourage a high level of informal interactions, networking, and dialogue amongst participants. Idea teams will have an assigned booth (table or other structure) within the exhibit hall to showcase and discuss their ideas. For the pilot NLC we envision three idea booth sessions, each of around 90 mins, where two will be held in this morning session (e.g., 9-10:30am and 11-12:30pm) and the third in the afternoon session. Each think-piece will only be presented in one of the idea sessions, so the physical booths will each have different ideas throughout the day. Attendees not presenting their ideas may visit the idea booths to learn about and discuss the ideas and concepts being put forth by their NL colleagues.

Day 2 (lunchtime social programs): Scientists meets mission support colleagues

Day 2 (afternoon) – One Idea Booth session and Unconference component: With three idea booth sessions in total, this afternoon session would begin with the final ideas session (e.g., 2-3:30pm) which will be exactly analogous to the two morning sessions. Voting on the presented ideas will have been possible since the start of the day, however, in order to identify the ideas that resonated most with attendees we would close the voting at 4 pm and shortly thereafter announce the most popular ideas.

The ideas with the most votes, or highest scores, will then be invited to give a plenary presentation as a key part of the closeout session to be on the morning of day three. We will select five ideas in each of the three broad topical areas: science, technology, and operations. This will ensure that the NLC serves as a clearinghouse of new ideas with the opportunity to be impactful to virtually every corner of the NL system. Examples of S&T topics could include technical research topics that constitute new initiatives and/or strategic directions for DOE, and possible operations topics could include DEIA, NL branding, hiring and retention, etc. Prospective presenters will be encouraged to think outside the box and put forward innovative concepts that constitute big ideas and encourage multi-lab participation.

To increase the networking and collaboration opportunities for this meeting we will schedule a Unconference [3] component of this conference between 4-6pm. To facilitate these activities that reinforce the notion of sharing and exchanging ideas with your NL counterparts, we will have several breakout rooms and unconference sessions may include lectures, training sessions, and open discussions focused on special topics of interest.

Day 2 (afterhours social programs): Science Ted Talk

Day 3 (morning) – Idea Presentations and Closeout: This session will likely begin with a high profile talk from a leading researcher at the NLs to discuss a grand challenge topic. Following this inspirational talk, we will transition to presentations from the individuals/teams behind the 10 leading concepts from the Ideas Showcase, as determined by the voting on day two. This will aid in broadening the awareness and amplification of the most compelling concepts to the broader DOE and NL community. And ideally, these presentations will help spearhead follow-on discussions and new, cross-lab collaborations. These presentations will be followed by an award acknowledgement by someone from DOE or NL senior leadership. Lastly, the best concepts will then be highlighted in the NLC conference proceedings to be made available on OSTI after the event has concluded.

NLC Appendix B: A Mock-Up NLC Program Guide

Cover page

Program Guide

Opening event
- **Keynote speakers**
- **Highlights from NLs**

Program of Areas
- S&T Booth program
  - Booth 1
  - ...
- Mission Support Booth program
  - ...
- DEI Booth program
  - ...

After hour social programs
- Science Ted talk
- Scientists meet Infrastructure
- Early careers meet NL Directors
- ...

Closing event
- **Award session: best idea booth**

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ENDLESS Frontiers: A Journal for the National Laboratories to Engage Stakeholders and the General Public

Mei Bai (SLAC), Ram Devanathan (PNNL), Kevin Doran (OSELP), Jamie Dunlop (BNL), Ryan Ott (Ames), Bill Pike (PNNL), Dolores Sanchez (SNL), Sanjaya D. Senanayake (BNL), Francesca Toma (LBNL), and Robert Wagner (ORNL)

Executive Summary

We propose a periodical publication unique to the National Laboratories to stimulate inclusive dialogue and collaboration among all Laboratory staff members, DOE and stakeholders that engage with the DOE-NL system. Given countless emerging challenges that DOE National Laboratories aims to tackle we intend to name this journal: ENDLESS Frontiers, to have it published quarterly or bi-annually and to enable its access to the general public.

Such a journal is designed to launch a communication of the best ideas and practices of the research and operations of the DOE National Laboratories. Our goal is to propagate and harmonize knowledge, promote innovation, discoveries, and science capabilities, and ultimately broadening the awareness of the extensive impact made by the national laboratories. We aim to objectively discuss and reflect on common concerns and challenges.

The main challenge of such a concept is to establish the governing principles, to allow for impartial and incisive strategic discussions. Secondarily, the establishment of an operating body to allow for a sustainable journal operation. Our request includes endorsement of the concept and starting resources to support the pilot business model. We propose to first establish this pilot program within the Oppenheimer Leadership Network (OLN) for the initial few years. During the pilot program, we will further develop the concept including governing principles, enabling support structures, create a steady state business model, and transition steps towards the establishment of a sustainable National Laboratory wide ENDLESS Frontiers journal.

Overview

Communication is one of the key ingredients for any organization to engage both internal employees and external partners/supporters. DOE and its National Laboratories have been investing in this area via multiple means and medias. Here is a short list of communication approaches, channels, and medias:

- DOE websites with functional information and highlight
- LinkedIn posts of highlights and achievements by NL communications staff
- Various lab-wide weekly or monthly bulletins, news broadcasts, etc.
- Topical cross-labs publications, such as
    - **Symmetry**, a joint online publication by FNAL and SLAC https://www.symmetrymagazine.org/ for promoting particle physics. It receives funding through DOE. The intended audience is the high energy physics community.

- **NNSA quarterly LDRD highlights**. https://www.lanl.gov/projects/ldrd-tri-lab/quarterly-highlights.php. The intended audience is program managers and other stakeholders within DOE such as industrial partners, universities, state or federal congressional offices and the general public. This newsletter is intended to inform decision makers, foster technology adoption by national security and defense program managers, to enable all readers to track the development of new and expanding capabilities, and to see how others have implemented recent advances and to learn about the programs, products, and collaborations inspired by our leading- edge R&D.
- **DOE LDRD Highlights brochure**, that is published every five years or so. The latest issue can be found at https://www.lanl.gov/projects/ldrd-tri-lab/_assets/docs/ldrd-highlights-brochure.pdf.
- **National Laboratory Management & Operations**, a monthly publication by Battelle for its National Laboratories. The intended audiences are Battelle managed laboratory staffs, particularly in management, commercialization, and community engagement. It is solicited and distributed via email initially by the editor from and to the lab designated point of contact.

These communication channels have been local either within individual laboratories or within a specific science or engineering community. Some of them focus on achievements and have a top-down approach. Throughout this Oppenheimer program, it has come to our attention that despite these efforts, the knowledge of various basic and key functional aspects of DOE and its National Laboratories is not evenly distributed among national lab NL employees, especially among early and mid-career staff members. This could hinder the intention of enhancing inclusive cross-cutting collaborations and could also become barriers for retaining talents within the NL systems. The need for dissemination of information becomes even more important with the new hybrid operating model following the COVID-19 pandemic.

While there are multiple ways to broadcast the national lab stories, it seems there is not yet a platform for objectively exchanging concepts related to best practice. In addition, currently scientific and technology innovations and the mission support communications tend to be compartmentalized within small circles of influence. Given the rising complexity of challenges that all National Laboratories have been facing, it can be beneficial to have a platform to further integrate the mission support staff with science and technology development staff.

This proposed journal, ENDLESS Frontiers, is designed to propagate best practices, highlight innovations, drive collaboration, share impacts of DOE national laboratories, and advocate the DOE mission to the public. The intended audience is primarily contributions from national lab employees and DOE staff members. Once the journal is well established, it can also serve as the source of information for the stakeholders that engage with the DOE national laboratory system, such as industrial partners, universities, state, and congressional offices.

Business Model and Feasibility

The business model for steady state operation requires a sustainable operating budget with a team of chief editor, administration support, technical support including IT, and editorial board. An executive committee is needed to approve the main theme of each issue. The list below is to show the responsivities of various roles in this model along with the estimated effort.

- Chief editor: .5FTE
  - Responsible for organizing the journal
  - Can be up to 1 FTE in the steady-state operation and seeking opportunity to grow
- Admin support: 0.25 FTE
- Technical (Web/IT) support: 0.25 FTE
- Operation budget (IT, travel, limited prints, Misc)
- Editorial Board: subject matter experts from each NL with confirmation from NL leadership
  - Responsible for proposing the content of the journal, as well as ensuring the integrity of each article
  - Serve on two-year term with renewable condition and concurrence by NLDC
- Executive committee:
  - Responsible for approving the main themes of the journal
  - 6 members consisting of the chief editor, one communication officer from one of the NLs, one from the NLDC, and three from editorial board who are elected by the editorial board with confirmation from NLDC
  - The communication officer will rotate on a yearly basis to ensure timely inclusion of all 17 NLs. The other 5 members will also rotate at predefined intervals.

We envision the team can be jointly supported by the national laboratories. Such an approach has been also adapted by some of the cross-lab journals such as Symmetry.

Challenge

- To establish a mechanism and medium to communicate and dissipate information such as a journal, some possible challenges include:
- Showcasing DOE NL capabilities and achievements vs. top-down cheerleading style?
- Finding the right balance of stimulating open dialogue among NL staff members, yet avoiding non- constructive criticisms and attacks
- Obtaining funding resources for sustainable operation for consistency and maximizing the impact
- Fairly/equally representing all 17 NLs in a balanced fashion.?
- Reaching a design to complement existing communication channels.?
- Establishing and maintaining copyright and other legal requirements.
- Archiving and storing documented information. One practical option is to register a domain such as endlessfrontiers.org.

Our Request

Endorsement of the concept, and the pilot business model and budget (in-kind contribution), support for seeking long term budget (via FWP, etc.)

To ensure there is an effective path that allows for the establishment and maintenance of such an idea, we need the NLDC's endorsement of the concept and the business model, in particular,

- Endorsement to establish a pilot program within OLN. During this period, further develop the concept including the establishment of by-laws, governing structures, steady state business

model and transition steps towards. Achieve consensus from OLN of what is critical to the role and deliverables of a journal.
- Explore the right governance model to provide effective and meaningful analysis and commentary on DOE and the NL system in a way that seeks to drive forward the mission of the journal. Seek guidance from a cross section of stakeholders.
- Socialize the idea with DOE communication staffs as well as various program offices.
- Investigate the feasibility of seeking funding in the proposed DOE foundation in the latest CHIP Act.

Benefits and Impact

This journal may be a key agent for branding the National Laboratory system including a critical vessel to advance knowledge and concepts that can sustain leadership for the National Laboratory complex. It could help to bridge the gap of knowledge about the NLs with the public but also internally to all staff and thus enhance the chance of grassroot collaborations within and external to the NLs especially in the cross- cutting fields.

With the right governance model, this approach could provide effective and meaningful analysis and commentary on the DOE mission, and the NL system in a way that seeks to drive forward the vision of the laboratory complex of the future.

By making it also available to all NL employees and the public, it also helps to reinvigorate the sense of mission and recognition of identity. Together with other think-pieces, such as Identity and Awareness of the NLs and the NL Conference, it can also further enhance the communication with policymakers, industry, and the public.

Process and Acknowledgement

This idea came out of the discussion among this Cohort about think-pieces, in particular the ideas of National laboratory identity and National laboratory conference. It was evident that a written medium to dissipate information was much needed. We also reached out to a few colleagues including lab directors, head of communications, organizers of some of the publications mentioned in the overview section, etc. We are very grateful for their feedbacks. The development of this idea has also been significantly helped by Kevin Doran, who not only guided us during the initial brainstorm phase but also provided invaluable suggestions including the name of the journal. We are also very thankful to the fruitful discussions with our Cohort member Dr. L. Stonehill, the LDRD program manager from LANL.

View Slides

National Laboratories Explorers Program

Liz Hoffman (SRNL), Jon Russell (SLAC), Catherine Hurley (ANL), and Kevin Doran (OSELP)

Overview

The National Laboratories Explorers Program (Explorers Program) addresses the overall challenge of increasing high school student interest in pursuing a science technology, engineering or mathematics (STEM) degree and, specifically, considering a career in the national laboratory system.

There is a need for increased public recognition of the breadth of mission, national impact and career opportunities at the national laboratories. As workforce demands continue to exist alongside fierce global competition for a finite talent pool, the pressure to attract and retain a skilled workforce will increase. The Explorers Program is a recognition and incentives scheme that motivates students to participate in multiple educational programs across the National Laboratories and delivers exclusive content to participants while fostering an environment for students to engage with multiple national laboratories, encouraging familiarity with the national laboratory system.

Program Benefits

By laboratories joining forces to educate students on the specific science and technology needs worked by the laboratories, there is an opportunity for a step change in the approach to priming the future workforce pipeline without a step change in resources or time. Increased student awareness will lead to more individuals seriously considering the National Laboratories as part of their career path. By leveraging the collective power of the laboratories, more students will realize the unique science and innovation being undertaken at the laboratories, including in regions where a national laboratory may not exist.

Requiring a significant time investment on the students' part, this program will also attract the attention of parents and other influential adults in a student's life. Expanding the general public's awareness of the national laboratories is crucial to capturing student interest and realizing national laboratory career opportunities. Connecting programs from across the national laboratory system creates opportunities for all the laboratories to leverage the progress made by other laboratories and further engage with the public. With a broad reach of both national laboratory programming and participating student populations, the Explorers Program will amplify the possibility of a National Laboratory career path resonating with students.

Many laboratories currently have exceptional virtual or hybrid programming for high school students. In addition to these offerings being advertised by their individual lab, the Explorers Program proposes to aggregate and catalog these offerings in a central web portal. The offerings on the Explorers Portal would link to the host lab allowing interested students to get more information about each lab, while the links on the individual laboratories' websites would reference the Explorers Program to allow students to find similar programs of interest at other laboratories. In essence, the program is building a hub of virtual educational outreach possibilities for students to engage.

When students create an account on the web portal, the Explorers Program would track student progress across all associated laboratory educational programs. Students would receive points for each virtual program completed. Upon obtaining a certain number of points, a student would be provided a certificate naming the individual as a National Laboratory Explorer. The student would then have access to "Explorers Only" content, such as keynotes from Laboratory Staff, networking opportunities, mentoring and resources for internships.

For an individual laboratory's student program to be included in the program catalogue, it must meet certain criteria. Proposed criteria for participating program content would include:

1) **Virtual/Hybrid**: This program must be accessible to students across the country.
2) **High school level**: To ensure all participants are engaged at the appropriate academic level.
3) **Non-trivial**: For the program completion to be meaningful, individual programs should require non-trivial intellectual contribution and/or time commitment from the participants.
4) **Inclusive**: All programming associated with the Explorers Program must be accessible to all participating students.

Process and Encountered Challenge

Entities engaged to develop this think-piece include the National Laboratory Education Directors including the K-12 subcommittee, Chief Communication Officers, the Laboratory Operations Board, and members of Cohort 5 including the group working the national laboratory awareness think-piece.

All groups presented with the idea agreed that the concept of increasing engagement with high school students to educate them on national laboratory science and technology was worthwhile.

Challenges were encountered when discussing the implementation of some of the preceding think-piece concepts leading up to the Explorers Program. Individual laboratories with successful outreach and educational programs do not want to disrupt ongoing programs or create significantly more work for limited staff to administer new programs.

The Explorers Program framework was designed to address specific feedback gathered during the process, including the following:

- Reduce the burden of creating new educational programs
- Minimize additional national lab staff effort needed to engage with students
- Leverage existing student programs already in place at many national laboratories
- Promote uniqueness of mission and technologies of each national lab rather than making content generic to cover all labs
- Foster opportunities for student populations outside the current regional reach of the national laboratories to engage

Recommended Actions

To establish the Explorers Program and accelerate high school students' interest in a national laboratory career path, the following actions will be needed:

Platform and Communication Tools
Develop a mobile friendly website including: • Identify/account tracking system • Mechanism to reset passwords • Content Catalogue and schedule • Progress tracker • Certificate processing • Identify and support a web tool for existing virtual programs to provide a link for students acknowledge participation
Content
• Design initial pdf certificate • Supply the webpage content, including updated lists/links of programs • Develop content for "Explorers Only" – keynote presentations, updated links for internships, etc. • Promote the program, particularly to student populations currently underserved by existing laboratory programs • Provide resources to maintain the student participant contact list and track student involvement. The distribution list of science educators across the country would also require maintenance.

Cost Estimate

The Explorers Program would be relatively low cost to implement relative to the potential impact it would have on increasing awareness of the national laboratories with high school students and expanding aspirations of high school students to pursue a career at a national laboratory. The anticipated costs to establish and host a web presence would be $50k to establish with a $15k annual cost to maintain. Additional costs would include each laboratory's engagement with providing current links to educational opportunities and content for "Explorers Only."

Initial Development	
Program Branding - Logo Design, logo edit options - Style Guide (color, logo, usage, fonts)	$10,000
Website Design - Site Architecture - Design Concepts, revisions to selected concept - Design Page Templates (6) revisions to layouts included	$10,000
Website Development - WordPress platform	$20,000
Ongoing Maintenance	
Hosting - 2 hours weekly to answer contact inquiries and update links	$300/year
Communications	
Drip campaign with social and digital - 6 email designs, 8 social tiles, and digital ad set with multiple sizes	$15,000

Challenges/Risks

- Ongoing administration and ownership of program and site
- Agreement/approval of shared content
- Initial and continued utilization from laboratories
- Awareness for target user base
- Compliance with child online privacy laws

View Slides

The National Labs' Talent Opportunity Pool (TOP) Database

Natalie Holder (SLAC), Stephen Smith (JLAB), Liz Hoffman (SRNL), Juliana Fessenden (LANL), Jao van de Lagemaat (NREL), and Tracy Spooner (PNNL)

Goal: To increase the diversity of applicant pools and attract more talent with critical skills into the National Lab system through the creation and utilization of a shared resume database.

Overview

Many of the Department of Energy's (DOE) National Laboratories face two related workforce challenges:

1. Increasing the diversity of candidate applicant pools and
2. Sourcing talent for critical roles.

In 2021, women comprised only 20% of technical research staff and historically underrepresented employees (HUEs)—defined as African-American, Latinx, and Native American employees—only accounted for 12% of these roles. At some Labs, the intersectional data of race and gender would reveal even less demographic diversity.

While many Labs creatively use LinkedIn and other social media as a part of their outreach and recruiting strategies, it is not uncommon for Labs to resort to expensive executive recruiters and search firms to find candidates for hard-to-fill positions. The Labs face significant headwinds in recruiting talent, resulting in low applicant flow, ranging from job seekers' relative unfamiliarity with the DOE National Labs and higher industry compensation packages, to the many issues connected to geography. The DOE National Labs located in proximity to high-tech employers—such as the Labs located in Silicon Valley, Chicagoland, and other regions—have the additional burden of competing with private industry while also attracting employees to regions where the cost of living is significantly higher than the national average.

Process

Cohort 5's Talent Opportunity Pool (TOP) think-piece presents an opportunity for all 17 National Labs to work collaboratively to improve our recruiting outcomes. TOP would be a shared resume database in which all the participating Labs would submit the resumes they received for an open position to a repository, such that the other participating Labs could view these resumes.

To determine whether TOP was viable and to determine the obstacles it would encounter, the TOP committee met with the National Lab Chief Human Resource Officers, the Chief Diversity Officers and the Lab Operations Board. Each raised questions around applicant confidentiality, technological infrastructure to support TOP, bandwidth, and competition among the Labs for talent. Ultimately, all of these constituents agreed that TOP presents solutions to the demographic diversity and applicant flow challenges confronting our labs.

Challenges

Competing for talent, increased workloads, interlab competition overall present steep challenges, however TOP was devised to address them in a way that benefits each participating lab.

The primary challenge TOP faces is the issue of competing for talent and reducing the risk of poaching finalists or selected candidates among the Labs. Resumes would only be submitted to the database once the position has been filled and the candidate has been onboarded. To be eligible for submittal to TOP, an applicant would be required to indicate their interest in being considered for other career opportunities by other Labs. This opt-in process would also provide information on the TOP process, including the provision that resumes are only forwarded to TOP once specific milestones are achieved. This process would both ensure Labs have the express permission of candidates to share their resumes with other Labs and provide candidates with a clear understanding of the TOP process. The TOP process would also be configured to ensure that any applications submitted by current employees of a National Lab remain confidential. TOP could also be configured to allow applicants to select the Labs with whom their resume can be shared, should they not be selected for the job they initially pursued.

Similar to the ORAU's Zintellect Total Fellowship and Internship Management System used by the Oak Ridge Institute for Science and Education to administer programs for DOE, including the Omni Alliance Internship program, TOP would enhance the ability of the National Labs to identify and attract exceptional talent. By cross-pollinating candidates, the Labs could significantly increase the pool of candidates they are considering for opportunities. With increased resumes from candidates who are familiar with and have expressed an interest in working for a National Lab, participating Labs could see a reduction in the time it takes from posting an open position to filling it. By using a similar database tool such as Zintellect, the HR recruiters and hiring managers experience would be greatly enhanced through the ability to filter the resumes in the database based on education, job experiences, and a host of other categories to make the resumes easier to categorize and evaluate. In short, Zintellect can be customized to fit what TOP needs. Virtually all of what TOP needs is already in the system, from AI classification and ratings of resumes and candidates, to systems that allow multiple individuals to look at applicants. However, the workflow would need to be programmed.

Another challenge is the necessity of TOP to be a full-service, automated system, eliminating the need for a recruiter or hiring manager to drive the resume submission process. For example, if a person applies for a job at SLAC, there is a link on the form indicating that the applicant wants to opt-in to the repository. If the applicant selects yes, they are taken to a Zintellect form where they input the information. This step happens at the beginning of the applicant's process. Zintellect would need to embargo this information until SLAC says the person did not get the job. This could be done by having SLAC receive a monthly email of applicants that are still embargoed, and then SLAC can give Zintellect permission to release the candidate. All of these procedures—the form, embargo system, push of information on those still embargoed to SLAC, etc.—could be created by Zintellect. Zintellect has a privacy policy where its policy holders agree to privacy terms that are based on—and fully consistent with—the DOE, European Union, California, and other jurisdictional privacy rules, regulations, and overarching laws. Per Zintellect, no matter where someone comes from, they have agreed to the sharing of their information—if that is the use case—in a way consistent with Federal and sub federal regulations.

Zintellect has the capacity to use Artificial Intelligence, for instance, to review resumes and match them to opportunities; AI is also used to rank resumes in terms of overall fit for HR Points of Contacts. Also, when an applicant is deemed ineligible, AI provides the applicant a list of other positions that might be a good fit. In addition to AI, there is often a human in the loop that matches resumes for specific programs.

The following is a high-level sketch of how the TOP system and process could be configured:

1. Candidate applies to a National Lab position.
2. Within the National Lab online application process, the candidate is asked if they would like to opt-in to TOP. A brief description of the process is provided. The process explains that TOP will only receive their resume if they are not selected for the job to which they are applying.
3. If the candidate chooses to opt-in, they are sent to a secure online form that asks if they would like to make their resume available to all participating Labs or a subset of those Labs. Candidates then select which Labs to make their resume available.
4. Candidates are provided with an email confirmation of their TOP selections and given a link to opt-out of the process, should they so choose.
5. Once a candidate is selected for the job and on-boarded, the resumes for all unsuccessful applicants that opted into TOP for that particular posting are sent to the TOP database. Participating HR managers then receive an automated notification containing relevant metadata to help categorize and evaluate the submitted resumes.
6. HR managers and hiring managers can login to the TOP database and perform queries to identify potential candidates for applicant pools through keywords and search terms (e.g., school affiliation, area of expertise, etc.).
7. After 180 days, resumes in TOP will be purged.

Recommendation

Overall, a larger database of resumes would give the National Labs greater access to cognitively, geographically, and demographically diverse candidates. Such diversity would further our mission, our science, and our impact.

We recommend convening the NLCHROs, the NLCDOs and the team at Zintellect to meet to further discuss TOP and determine a path for implementation.

View Slides

System Innovations in Benefits

Kathryn Mohror (lead, LLNL), Julianna Fessenden (LANL), Simerjeet K Gill (BNL), and Jao van de Lagemaat (NREL)

Overview

The post-COVID job market is extremely competitive. Recruiting and retention have become significant challenges for the national laboratories. Job seekers are demanding more incentives and greater work flexibility—areas in which the labs are traditionally less competitive. We need to increase the value proposition of working at our labs and establish effective ways to communicate the value of a long-term lab career to potential and current employees. To achieve this goal, we propose changes to the labs' benefits and communication strategies and creating a system-wide HR vendor to enable transferability of benefits and/or hold benefits for the lab complex. We offer the following specific recommendations:

1. Improve awareness of current benefits offerings to employees.
2. Alter current policy and contractual limitations on benefits.
3. Establish a system-wide HR vendor that can provide benefits offerings to all laboratory staff.

The impact of these recommendations will include increased flexibility and agility for laboratory directors (LDs) and their leadership teams in choosing benefits, a wider selection and more affordable benefits for laboratory staff, transferability of benefits across the lab system, enhanced recruitment and retention opportunities, and a more satisfied and informed workforce.

Process

In developing our think piece, we engaged with the following people and are very grateful for their time, expertise, and help: Mark Peters, Executive Vice President for National Laboratory Management & Operations at Battelle; Kim Budil, Laboratory Director, Lawrence Livermore National Laboratory; Jack Anderson, Lead, Laboratory Operations Board HR Toolkit Working Group; Laboratory Operations Board; and LLNL, LANL, NREL, SNL HR staff.

Recommendations

Proposal 1: Advertise current benefits offerings to employees

Challenge: While the labs do offer solid benefits, many of the offerings beyond health and life insurance and retirement savings are not well-known to the lab workforce and go unappreciated.

Proposal: We propose that the LDs establish a communication campaign to inform employees of the current benefits available to them. We suggest techniques to raise awareness such as reworking benefits websites to clearly and plainly advertise current offerings, and seminars that explain benefits at regular intervals, e.g., annually. Additionally, we suggest regularly highlighting lesser-known benefits on the front page of internal lab news sites and possibly social media, e.g., "Lab employees can take advantage of discounts on personal car rentals." Benefits sites also need to have resource pages where these lesser-known benefits are organized and easy to find. Finally, we suggest employing front-line managers to raise awareness of benefits by giving them information to share with their reports on how

lab benefits compare to what is offered by competitors, e.g., how do the lab's overall benefits compare to competitors that offer flashy incentives like stock options?

Benefit: By taking the relatively simple step of increasing awareness of available benefits, lab staff will feel an increased sense of being valued by the organization.

Proposal 2: Alter current policy and contractual limitations on benefits

Challenge: LDs are unable to adjust benefits to match the desires of their current and potential workforce because of lengthy approval processes and restrictive requirements.

Proposal: We propose the removal or reduction of DOE policy and contractual limitations on benefits to provide more flexibility and agility to LDs and their leadership teams in deciding what is best for their labs. Employees at different labs have different challenges owing to regional differences, workforce demographics, and differences in mission space. We advocate giving labs as much latitude as possible to decide what is best for their staff as long as they remain within their budget. One example of a change to contracts and policy is removing the limitation on benefit spending with respect to comparator organizations. Another example is removing the need for labs to get DOE approval for changes or establishing a reasonable monetary threshold for benefits changes below which no approval is necessary. To advance this proposal, the Laboratory Operations Board (LOB) or the Secretary of Energy Advisory Board (SEAB) could charter a working group to provide specific recommendations. These recommendations could be used to operationalize a pilot project at one or several labs, similar to the Revolutionary Working Group initiative at SLAC and the Evolutionary Working Group effort at Fermi.

Benefit: Removing or reducing policies and limitations on benefits will enable LDs to pivot to meet to the rapidly changing demands of the post-covid workforce.

Proposal 3: Establish a system-wide HR vendor

Challenge: LDs face significant challenges in being able to offer an adequate variety of benefits to match the range of needs of their increasingly diverse workforce due to their lower negotiating power for a small laboratory population.

Proposal: We propose the establishment of a system-wide HR vendor that will offer benefits to employees across the lab system. We envision an opt-in strategy for both the labs and employees, i.e., LDs can decide whether to participate and employees from participating labs can choose from a combination of lab-local and system-wide offerings. For labs that participate, we expect that they will retain the ability to offer benefits that are available regionally in their lab-local plan, e.g., Kaiser Health in California, or offer benefits that are not generally available, e.g., retirement pensions. The system-wide HR vendor could be managed by the M&O for a single lab on a periodic rotation, e.g., 5-years, to reduce management burden on DOE. Alternatively, DOE could issue a Broad Agency Announcement calling for proposals from potential HR vendors. A third-party vendor could then be selected by DOE, with labs able to opt into the HR benefit services provided by the vendor for select hires.

Benefit: LDs will be able to provide a wider variety of benefits with lower costs for their laboratory staff because the system-wide HR vendor will negotiate for a larger population compared to the population covered by any individual lab. Employees will be able to transfer benefits such as leave accrual and

retirement plans from the system-wide HR plan across laboratories[1], encouraging staff that need to relocate to remain within the national lab system instead of moving to industry. The system-wide HR vendor can also be used for coverage when employment ends to improve retention and encourage returning to the lab system after attrition, e.g., health care premiums after retirement or continued eligibility for an employee discount program after attrition to keep a tie back to the labs.

[1] Mark Peters stated that Battelle is implementing a workforce initiative across the labs where they have a management role, with one motivation to make it easier for staff to move between labs. One advantage Battelle sees for this approach is that it will be easier to move people with critical skills, e.g., skills needed for very large project management, between labs as needed, with the goal of not affecting staff benefits, retirement packages, or service accruals.

View Slides

Ensuring a Diverse, Equitable, and Inclusive Operations and Research Culture Across the National Laboratory Complex

Kate Anderson (NREL), Sanjaya Senanayake (BNL), Tracy Spooner (PNNL), Laura Stonehill (LANL), Francesca Toma (LBNL), Robert Wagner (ORNL)

Overview

Innovation is born from diversity and inclusion. Establishing a diverse, equitable, inclusive, and accessible (DEIA) research culture is foundational to the success of the national laboratory complex. It is also of particular importance to the U.S. Department of Energy (DOE) right now, as evident through the Justice40 Initiative, the Office of Science requirements for DEIA plans in all proposals, and new Performance Evaluation and Measurement Plan (PEMP) DEIA goals. As stated by Secretary of Energy Jennifer Granholm, equity does not just support the mission. "Equity IS the mission." This represents a unique opportunity for the national labs to lead—not just by meeting the DOE requirements, but by proactively embedding DEIA principles in research and operations to advance innovation for the nation. There has already been extensive work in the national laboratory complex in recent years to amplify DEIA. This includes hiring chief diversity officers at many of the laboratories, developing lab DEIA plans, holding annual inclusion and diversity workshops with lab directors and chief diversity officers, and measuring diversity statistics across the national laboratory complex. Acknowledging all the progress already made, we offer recommendations that align and build on existing work to further advance DEIA across the national laboratory complex. These include: 1) Developing DEIA community standards for the national laboratory complex; 2) Expanding diversity metrics to track progress over time and incorporate measures of inclusion; and 3) Integrating DEIA and energy justice into our daily research and operations work.

Process

These recommendations were developed by a cross-lab OSELP team representing a mix of research and operational functions at six labs, with input from OSELP cohort members at all labs. The NLDC Chief Diversity Officers group, the Head of the DOE Office of Diversity, Equity, Inclusion, and Accessibility, the Director of the DOE Office of Economic Impact and Diversity, and the Office of Science Senior Science and Technology Advisor on Equity provided feedback to refine and improve these recommendations.

Challenge

All the national laboratories have established DEIA visions, initiatives, and actions. These efforts have been important for educating and engaging the laboratory staff on the importance and opportunities to implement a more diverse, equitable, inclusive, and accessible culture. A major challenge, beyond educating and engaging, is establishing this culture such that it is foundational and core to our identity and mission, much like safety. The challenges to establishing this culture have much in common with the challenges the national laboratories addressed over the years in establishing a healthy safety culture.

For safety, the labs transitioned from a punitive culture—where staff were hesitant to bring up issues for fear of reprisal—to a learning culture where questions and growth were encouraged. This culture shift was enabled by simple, easy-to-understand guiding principles (such as the Safe Conduct of Research (SCoR) principles developed jointly by the Battelle-affiliated laboratories), as well as metrics for accountability, training for researchers to embed safety in daily work, and staff and funding resources for implementation. DEIA shares many parallels with safety, but the analogy only extends so far. The impacts of poor safety culture are obvious in injuries and accidents, while the impacts of poor DEIA culture are often less apparent in slow bleeding of talent over time. The lower visibility of DEIA impacts makes the development of a strong DEIA culture even more important.

Recommendations

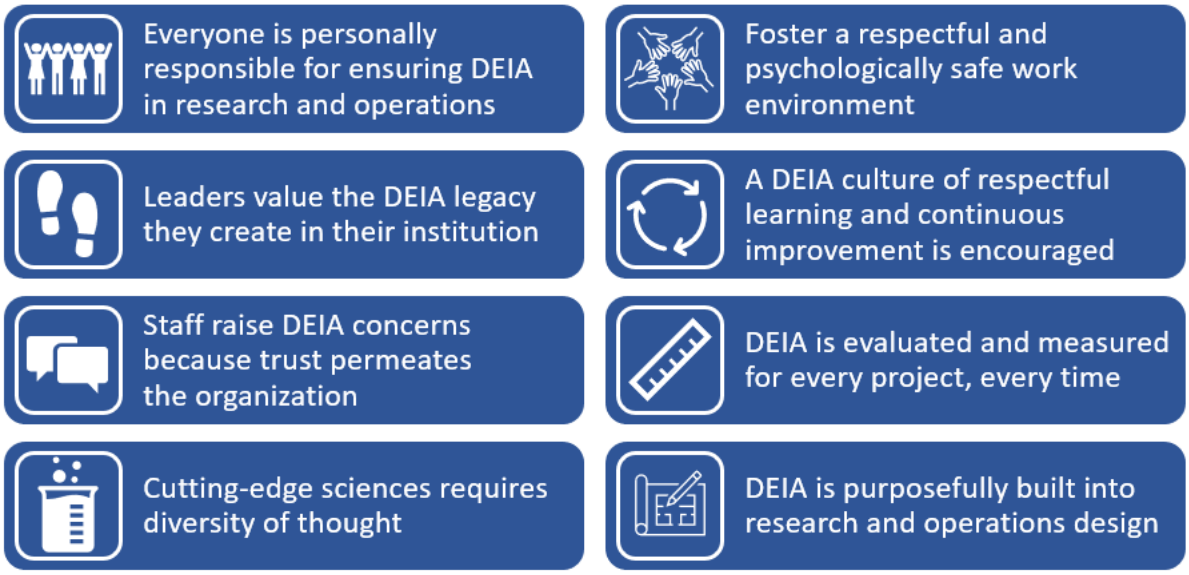
The following recommendations focus on strengthening DEIA culture across the national laboratory complex, using lessons learned from safety.

Recommendation	Summary
Develop DEIA community standards and best practices	The labs develop DEIA community standards and DEIA-informed practices to drive the transition to a stronger DEIA culture across the national laboratory complex. The purpose is to embed the standards and practices to ensure our team is diverse, equitable, inclusive, and accessible to further strengthen our research and operations. They form the underpinnings of a strong DEIA culture and provide a basic, universal, and easy-to-understand approach that resonates with and is actionable by all staff. These community standards could leverage the learnings and approach used to develop and implement safety principles, such as the Safe Conduct of Research (SCoR) principles developed jointly by the Battelle-affiliated laboratories.
Expand DEIA metrics to track inclusion and progress over time	The national laboratory complex expands DEIA metrics to 1) track inclusion; and 2) track progress over time. A common, annual climate and inclusion survey across all labs enables us to expand beyond diversity metrics, track measures of inclusion, and share consistent inclusion data across labs. Additionally, the DEIA data on the NLDC website is expanded to show longitudinal data over time rather than only the current year, enabling us to track progress.
Develop a framework and best practices for incorporating DEIA and energy justice in research and operations	Building on current DOE efforts to integrate DEIA and energy justice in research and operations, such as Justice40 metrics and required DEIA plans, the national laboratory complex develops a shared framework and best practices for incorporating DEIA and energy justice in research and operations to enable more equitable mission impact. Current lab DEIA efforts focus primarily internally on lab staff; integrating DEIA and energy justice concepts into our research design and execution enables broader impact externally beyond the national laboratory complex. This framework will combine the best practices of each lab to provide

employees at all levels guidance on how to integrate DEIA and energy justice into their work, including considering equity impacts alongside cost and performance, embedding greater community engagement, and designing and managing projects with equity in mind. This will include a framework of methods and metrics for integrating energy justice in research and operations and an online library of trainings and resources, accompanied by a communications and recognition campaign, to promote integration of DEIA and energy justice.

Appendix A: Example DEIA Community Standards

Diverse, Equitable, Inclusive, and Accessible Standards of Practice for Research and Operations



Appendix B: List of Interviewees

- NLDC Chief Diversity Officers group
- Laboratory Operations Board
- Lady Idos, Head of the DOE Office of Diversity, Equity, Inclusion, and Accessibility
- Shalanda Baker, Director of the DOE Office of Economic Impact and Diversity
- Julie Carruthers, Office of Science Senior Science and Technology Advisor on Equity
- OSELP Cohort members

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Innovation for Global Security

Dave Brannegan (ANL), Simer Gill (BNL), Kathryn Mohror (LLNL), Ryan Ott (Ames), Bill Pike (PNNL), Jao van de Lagemaat (NREL), and Ram Devanathan (PNNL)

Overview

Our nation faces a new era of great power conflict with determined adversaries in Europe and Asia. These powers, along with other smaller nations and non-state actors, present a challenging global security environment with an evolving suite of threats. Rapid developments in critical and emerging technologies and low barriers to access some technologies pose threats to our national security. China is close behind or on par with the U.S. in crucial innovation areas such as robotics, artificial intelligence, quantum information systems, hypersonic flight, telecommunication, and materials for energy technologies – posing potentially significant threats to U.S. security. Our national security demands that we maintain our innovation edge through coordinated efforts between DOE national laboratories to identify and counter over-the-horizon threats. These efforts will leverage the collective expertise in non-proliferation, nuclear, chemical, biological, and cyber security, and emerging technologies. They will be underpinned by outstanding fundamental science capabilities and tools across the national lab complex.

This “Innovation for Global Security” proposal seeks to strengthen collaboration between DOE national laboratories to accelerate security-focused innovation. We recommend building a coordinated research program in relatively underfunded critical and emerging technologies, such as human-machine interface, biosecurity, space technologies, artificial intelligence and autonomous systems, and advanced materials and manufacturing. The first step is to select critical areas for immediate investment based on input from the National Lab Director’s Council and key stakeholders. An inaugural workshop led by the Oppenheimer leadership network (OLN) can bring together the nucleus of a community of practice to pursue direct sponsor funding or lab-directed investments. If direct funding is not feasible at the start, several national labs should make coordinated LDRD investments to develop talent and accelerate emerging technologies toward deployment. The investments will be the seeds for enduring sponsor-funded consortia and a community of practice focused on over-the-horizon thinking. Multiple agencies will be able to draw from this community of practice when a crisis emerges. Finally, this community should hold annual workshops that gather researchers along with external experts to ideate on emerging threats.

The creation of intentional cross-laboratory communities focused on over-the-horizon national security threats will best position the U.S. to maintain our technological edge and leadership. Effectively investing in early-stage technologies in emerging areas will position the U.S. to innovate faster than our adversaries. While the collaborative community anticipates and counters over-the-horizon threats, it will also develop the next generation of our technical talent and sustain innovation by transitioning to sponsor-funding.

Process

This proposal benefited greatly from extensive discussions with two former directors of Los Alamos National Laboratory, Sig Hecker and Charlie McMillan, and the Laboratory Operations Board. These

discussions shed light on the global security challenge, the need for innovation and a diverse talent pipeline, and the history of fundamental science in service of national security. Discussions with current national lab leadership during the OSELP cohort's visits to national labs helped to focus the proposed ideas.

Challenge

Our nation's longstanding leadership in innovation and the resulting technological edge have underpinned our economic prosperity and national security. This leadership is at risk due to a confluence of global factors. American economic and military interests are being challenged in an unprecedented fashion by two great powers, China and Russia, smaller states, such as North Korea and Iran, and non-state actors. According to the National Security Strategy released by the White House in October 2022, the People's Republic of China (PRC) is a competitor with "both the intent to reshape the international order, and, increasingly the economic, diplomatic, military, and technological power to advance that objective."

The National Security Strategy recommends that "to outcompete our rivals and tackle shared challenges, America will need to maintain and refine its competitive edge by making critical domestic investments." According to a recent Independent Task Force report (no. 77, 2022) from the Council on Foreign Relations, "China is closing the technological gap with the U.S. … It will soon be one of the leading powers in technologies such as artificial intelligence, robotics, energy storage, fifth generation cellular networks, quantum information systems, and possibly biotechnology." Hypersonic flight is another area where the U. S. faces stiff competition from China and Russia (R. Stone, Science 2020).

The Department of Energy's (DOE) national laboratories are well positioned to address this challenge. The national labs are home to internationally recognized experts in basic sciences and engineering and steward extraordinary scientific tools including beamlines and high- performance computers. The labs have been successful in taking technologies from the bench scale and deploying them to serve national security missions. The DOE labs have collaborated for effective and timely response to a variety of crises such as the Fukushima-

> "A new American strategy must recognize that we face a global struggle of indeterminate duration against two great powers that share authoritarianism at home and hostility to the United States. They are challenging us not only militarily but also in their use of other instruments of power — development assistance, strategic communications, covert and other influence operations, and advances in cyber- and other technologies."
> **Robert Gates, Wash. Post, Mar 3, 2022**

> "Addressing the challenge from China and other rising science powers requires an ambitious plan of national investment in science and technology."
> **James Manyika, William McRaven, et al Council on Foreign Relations, 2022**

Success Story: US support for Ukraine
DOE lab teams anticipated the threat to connectivity and cybersecurity in Ukraine (strategic foresight). Teams from national labs worked with utilities on cybersecurity enhancements. The teams had a history of working in Ukraine and were familiar with the infrastructure. Sponsors knew where to tap the right experts across the complex and the team members knew each other across labs. Cleared staff (and uncleared staff with relevant expertise) were known. Core capabilities were also known. Multiple agencies such as the State Dept, Treasury, FBI, USAID, and US Cyber Command could engage this community for an agile response.

Daichi nuclear incident, the Deepwater Horizon oil spill, and the COVID-19 pandemic. The NNSA labs and other national labs have worked together under major national security programs and have managed organization across lab boundaries well as illustrated by the side panel on Ukraine. Traditionally, these successes have built on long standing foundational work in nuclear, chemical, and biological sciences to address known challenges. While there is ongoing work in hypersonic flight, quantum computing, and artificial intelligence, investments and knowledge in these areas are not as mature as in a conventional area like nuclear deterrence. At the same time, adversaries are investing heavily in emerging technologies, especially in early-stage research and development. At the current pace of technological advance by adversaries, our nation may have to play catch up in technologies critical to our security. Technological innovation takes 20 years or more to move from the bench to the field. There is a pressing need to proactively identify critical technologies and invest in foundational research and development at the national labs now.

Recommendations

DOE national laboratories should work together to build a coordinated research program in underfunded challenge areas, such as national security issues related to climate change, supply chains for critical materials, biosecurity, human-machine interface, autonomous systems, and quantum computing. Topical teams working across the national lab complex, and collaborating with researchers from allied nations, will position our nation to innovate faster than our adversaries. This community of practice in critical technologies should be initiated through direct funding or coordinated LDRD investments by multiple labs. This effort will nucleate and advance novel ideas, transition from LDRD to sponsor-funded consortia, and establish a national network of experts working on over-the-horizon topics. The recommendations are listed in the table below and discussed in detail.

Table 1. Recommended Solutions

Step	Recommendation	Responsibility
1	Endorse idea; identify emerging areas for immediate investment.	NLDC and NL CROs
2	Hold inaugural meetings to nucleate the community, establish mechanism and scope. Pursue direct funding if feasible.	OLN, NL experts
3	Coordinate LDRD investments by several labs in each area selected. (Details in the Multi-Laboratory LDRD think piece.)	NL CROs
4	Organize workshops like Gordon conferences to engage external experts, discuss challenges, ideate, and build a community.	Technical leaders
5	Transition from LDRD to sponsor funding and sustain the community of practice. Extend success to other areas.	Technical leaders

1. ***Identify and prioritize emerging national security challenges that require immediate inter-laboratory S&T collaboration and investment.***

We request endorsement from the NLDC for the concept of coordinated investments in emerging threats and technologies. The NLDC should develop a complex-wide, “Emerging Threat S&T Agenda” as a blueprint to guide inter-laboratory S&T (and associated investment). National Laboratories interested in this effort should identify, prioritize, and submit a list of the top five emerging national security

challenges. The NLDC should consolidate and prioritize this material, with input from National Laboratory Chief Research Officers (NL CROs), into a complex-wide "Emerging Threat S&T Agenda" and identify areas for immediate investment.

2. Hold an inaugural meeting to establish mechanism and scope.

Members of the OLN should work with the NL CROs to develop a mechanism for stewarding Communities of Practice in the selected areas. This inaugural meeting or workshop can be organized as a series of virtual planning sessions. This workshop will develop the framework for subsequent annual workshops and will identify the scope to be executed by different labs through coordinated investment in a specific emerging area. The workshop would potentially build enthusiasm for specific pathways for investment, which could be LDRD or direct funding.

3. Coordinate complementary LDRD investments by several labs.

In the absence of a direct funding pathway at the start, NL CROs from labs interested in a specific emerging security area should commit to coordinated LDRD investments. This is not an effort to change the mission of national labs or to get all national labs to focus on national security work. Instead, it is anticipated that several national labs will come together to collaborate and invest jointly to address an emerging national security challenge. Getting the national labs to work together only when sponsor funding materializes or when a full-blown crisis emerges is not conducive to rapid innovation. Pursuing individual, stove-piped national security research agendas within each national laboratory will not optimize mitigation of the dynamic threats of the multi- polar world. The collective expertise and tools of multiple national laboratories can be combined to identify and prioritize work in critical emerging areas of national security concern. The participating national laboratories should agree to support coordinated S&T and other internal investments to address emerging national security challenges. The details of coordinating such investments are presented in a separate think piece on Multi-Laboratory LDRD.

4. Convene the complex-wide community of practice.

Technical leaders from participating labs should establish an annual workshop series to bring the community together with experts from diverse disciplines to look over the horizon, ideate on emerging threats, and establish S&T roadmaps. These workshops will foster new thinking, innovation, and novel approaches to the challenges identified. The workshop framework will build a network of collaborators from across the lab complex and reinforce the integrated coordination model. Innovative communities will emerge through the workshops and enable a collaborative network, and dynamic workforce, and thematic teams focused on over-the-horizon challenges.

Equally important, the coordinated investment will enable the recruitment and mentorship of the next generation of the national security workforce.

5. Transition to sponsor-funded consortia and sustain the community of practice.

The coordinated LDRD investment in over-the-horizon challenges should be formally transitioned to sustained funding from various sponsors. The transfer of funding responsibility will correspond with a transfer of responsibility to sustain the innovative community as well. The sequence is critical to ensure emerging national security S&T remains focused on over-the-horizon challenges before being matrixed

into more structured sponsor investment strategies. Best practices and lessons learned will be captured, memorialized, and evaluated to inform future efforts that will help set up communities of practice in other areas.

Impact

We acknowledge that there could be challenges in getting Office of Science labs to invest in building capabilities for national security work. Moreover, each emerging challenge area has a vested set of stakeholders. Thus, the ultimate purpose of the proposed effort is not so much to own a particular capability, but rather to accelerate the national rate of innovation in critical areas. Coordinated investments in innovation for global security will help our nation maintain our technological edge and leadership, innovate faster than our adversaries, anticipate and counter over-the-horizon threats early, and build communities of practice that are available to multiple agencies in a crisis. In addition, this effort will develop the next generation of our technical talent and enhance the excitement of national security careers.

Further Reading

- National Security Strategy
- Critical and Emerging Technologies List
- Keeping our edge, Council on Foreign Relations, Independent Task Force Report 77
- U. S. support for connectivity and cybersecurity in Ukraine
- Robert Gates' op-ed in Washington Post, March 2022
- R. Stone, National pride is at stake, Science (2020)

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Accelerating Innovation Through Multi-Lab LDRD Investments

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Overview

The ability of the DOE National Laboratories to address critical challenges in science, energy, and security depends on a robust innovation pipeline. Laboratory Directed Research and Development (LDRD) is one engine of innovation that allows each Laboratory to pursue its own capability developments that chart new science and technology (S&T) ground.

However, the complexity and urgency of challenges in science, energy, and security and the threats posed to US leadership in S&T by adversaries[1] demand new approaches to ensure the laboratory complex continues to be a global innovation leader. To maximize their impact, the DOE National Laboratories must innovate how they work, finding new ways to partner across the system to tackle challenges bigger than any one Laboratory could plausibly address alone and increase their collective pace of innovation. Expanding the concept of LDRD to systematize strategic, cross-Laboratory innovation is critical to positioning the Laboratories to come together quickly to address emerging challenges.

Enabling diverse, multi-Laboratory partnerships will accelerate innovation through fast-paced collaborations where integrated teams will incubate critical technologies that can be moved through the research, development, demonstration, and deployment (RDD&D) pipeline to address national needs.

While multi-Lab LDRD investments have been made in the past, they have typically emerged organically from existing PI relationships. With the support of the Office of Science, LDRD Program Managers have initiated discussions about how multi-Lab LDRD projects could be implemented, but several strategic questions remain regarding the purpose and strategic relevance of such collaborative projects beyond practical issues of administration and implementation.

This think-piece proposes a systematic approach to identifying strategic themes, selecting pilot projects, and evaluating the success of collaborative LDRD programs in which scientists and engineers from multiple Labs opt in to participate and surface new combinations of capabilities for the national interest. This systematic approach, which we term CLIF – the Cross-Laboratory Innovation Fund – would create a strategic framework for investment while leaving the administration of cross-Lab LDRD to the expertise of LDRD Program Managers. Recommendations for this approach include (1) establishing an annual planning effort to identify Chief Research Officer- (CRO-) endorsed strategic themes; (2) instituting a pilot program focused on a single strategic theme; and (3) supporting LDRD Program Managers in creating a governance structure.

[1] "Protecting U.S. Technological Advantage" Consensus Study Report, National Academies of Sciences, Engineering, and Medicine (Washington DC: National Academies Press), 2022 (available at https://nap.nationalacademies.org/catalog/26647/protecting-us-technological-advantage).

Process

This think piece is the product of discussions among a multi-Lab team of OSELP Cohort 5 members, including leaders from S&T and Operations, as well as a LDRD Program Manager. Team members gathered initial input from LDRD Program Managers at several DOE National Laboratories to refine the scope of recommendations. The think piece concept was briefed to the annual meeting of LDRD Program Manager in October 2022. Feedback from that meeting included a positive reception from the Office of Science program manager responsible for LDRD at the DOE Office of Science (DOE-SC) Labs, who subsequently tasked a team of LDRD Program Managers to explore the mechanics of implementing such multi-Lab projects.

Challenge

Launching a systematic approach to coordinated LDRD investments addresses several innovation-related challenges facing the DOE National Laboratory Complex:

1. Many science and technology challenges that the Lab complex tackles are necessarily bigger than what one Lab could or should solve alone; it is also unlikely that any one Lab has or could have distinguishing expertise in all the S&T areas needed, especially to address challenges that are too far over-the-horizon to be programmatically funded.
2. Incubating multi-Lab teams can foster innovative team science more efficiently by bringing relevant experts together regardless of their home Lab, versus a single Lab attempting to hire all necessary expertise in-house; this is especially advantageous given current recruitment challenges and mirrors successful programmatic approaches such as the Energy Earthshots.[2]
3. Formation of cross-Lab project teams focused on incubating strategic capabilities can enhance readiness for when the Labs are called into service for critical national needs.
4. DOE and other sponsors already fund cross-Lab teams, but these often rely on existing "go-to" Lab partnerships that are sponsor-directed. Such efforts often are not sufficiently diverse and inclusive of complex-wide capabilities that would enhance innovation, and there is not a systematic approach to catalyzing multi-Lab partnerships in new R&D areas.
5. Healthy innovation practices are critical to the Lab community's success; models for scoping strategic cross-Lab investments and for executing the resulting projects can reveal and disseminate innovation best practices across the complex.

Recommendations

We propose piloting an approach to multi-Lab LDRD collaboration that would begin with an annual complex-wide call to identify strategic projects for coordinated investment, with an overarching theme endorsed by the NLCROs. From this process, one or more multi-Lab project concepts will emerge, with individual PIs from each Lab identified. Each Lab will develop and approve its LDRD project scope for these efforts using its existing processes, which will also result in each Lab deciding on an appropriate level of funding to dedicate to its participation. We do not recommend LDRD funds change hands for these projects; participating Laboratories would fund their own staff, and coordination could be handled

[2] The Energy Innovation Hubs have been a great example to support that bringing multiple expertise under the same roof can significantly accelerate scientific discovery and bring our Nation to lead in a given scientific field.

via a mechanism determined by LDRD Program Managers. We envision that projects will not involve most or even many Labs; multiple small pilot projects may be ideal.

The following are recommended actions to initiate cross-Lab LDRD investments:

Recommendation 1: Implement an annual or biennial planning process to solicit and select investment themes that would most benefit from multiple labs' expertise.

We recommend that the NLCROs charter a cross-Lab organizing committee to steward the process of identifying investment themes. This could be delegated to an Oppenheimer Leadership Network (OLN) subcommittee to execute. An annual call based on the selected themes would be distributed to Labs to decide whether to participate and initiate team formation. For the first pilot, the OSELP Cohort 5-proposed Global Security Innovation Communities of Practice activities would be a likely source of candidate themes. The NLCROs will make the final decision on themes for the annual call.

Once annual themes are selected, the organizing committee could hold an annual workshop with relevant S&T staff from Labs interested in participating in a theme, with the goal of framing fundable ideas by the end of the event. The timing of the planning cycle would be coordinated to precede annual LDRD budgeting processes for each Lab. Themes should be explicitly chosen to leverage both basic and applied Labs' capabilities, such as matching fundamental expertise with capabilities to accelerate deployment.

Recommendation 2: Identify at least one project to launch in the first year of the pilot, which should involve three or more labs.

As a result of the planning workshop recommended above, at least one fundable project concept involving several Labs will be identified. For each concept, a lead institution will be identified and the PIs contributing to the project will specify the scope and associated funding from participating Laboratories. There will be no minimum level of funding required for a Lab to be eligible to participate. Deliberate effort to create collaborations between basic and applied Labs and researchers will be encouraged.

The selection of multi-Lab projects, as well as the evaluation of individual project success, would be most appropriately undertaken by a multi-Lab committee of appropriate subject matter experts. The individual laboratories' LDRD Program Managers should define the overall process and recommend review committee members based on subject matter expertise, with involved Labs' CROs having final approval of committee composition. It is intended that each multi-Lab project would be two to three years in duration, with an annual briefing to the NLCROs and/or a delegated review committee to assess the success of both the overall effort to pilot a multi-Lab LDRD program and the success of the individual projects funded.

Recommendation 3: Support the National Lab LDRD Program Managers in establishing governance principles.

The National Lab LDRD Program Manager community is already discussing governance models for multi-Lab projects; the specific implementation details of cross-Lab projects should be left to that community to steward.

To simplify oversight, each Lab would determine its own scope; the cross-Lab investment process would simply coordinate it. Field offices would maintain their current oversight function, though we envision

an eventual evolution in the oversight model if this concept is successful. LDRD program offices will also need to develop approaches for managing intellectual property generated in collaborative work, though these may be no different from those used in externally funded collaborations.

Benefits and Impact

If successful, coordinated multi-Lab LDRD investments raise the collective capabilities in the complex in a strategic way. The capabilities developed under LDRD will still benefit individual laboratories (as the organizational home for the relevant people and expertise), but those capabilities will have greater impact at the complex level by catalyzing more ambitious grand-challenge-level thinking in LDRD portfolios and by being directed at problems larger and more urgent than individual Labs could tackle alone.

Multi-Lab LDRD investments can generate specific benefits, including:

- Catalyzing new proposal teams to take forward to DOE and other sponsors; cross-lab teams that work to inform sponsor strategy will be influential and successful cross-lab LDRD activities may serve as roadmaps for future DOE investment.
- Building effective cross-Lab teams on LDRD creates the necessary trust and coordination required to tackle externally funded programs. Sharing risk for early-stage investments may encourage partnering in new ways to lower technical risks. A teaming approach amplifies small investments from participating Labs to enable tackling a larger, higher technical-risk problem.
- Revealing innovation best practices from across the DOE complex that each Lab can learn from others.
- Allowing researchers exposure to other Lab leadership models, S&T capabilities, and leadership teams, providing some of same benefits as rotational assignments with less administrative complexity.
- Exposing differences in practices across Labs (related to compliance, oversight, etc.) may identify opportunities to improve them.
- Enhancing peer review from multiple Labs on the same investment area can hone strategic directions.
- Creating a sense among participating researchers of being part of something bigger can build loyalty to the DOE complex and improve retention.
- Demonstrating to DOE and Congressional stakeholders that Labs are collaborative and coherent, seeking areas of complementarity and demonstrating through real research that the complex is more than the sum of its parts.

Success Measures

An assessment of the success of a multi-Lab LDRD investment approach will be conducted by the NLCROs, potentially with input from a delegated review committee. Specific success measures for multi-Lab LDRD collaboration could include:

- Two or more labs working effectively together that had not previously collaborated in the technical area funded by multi-lab LDRD.
- Acknowledgement by Laboratory leadership that innovations made through multi-Lab LDRD were qualitatively better than what could have been achieved independently.

- Transition to sponsored funding for new multi-Lab collaborations launched by multi-Lab LDRD and/or enduring collaborations that would not otherwise have been built.
- Laboratories gaining access to programmatic funding that they might not have been able to access otherwise, with an emphasis on areas where the multi-Lab team “grew the pie”.
- Joint publications or other intellectual property (e.g., patents) from new collaborator teams that had not previously published together.

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Overcoming Barriers for a Modern, Net Zero Carbon National Laboratory Infrastructure

Ahmed Diallo (PPPL), Jamie Dunlop (BNL), Brian Egle (ORNL), Matt Garrett (SLAC), Catherine Hurley (ANL), Christine King (INL), Jao van de Lagemaat (NREL), Julie Mitchell (ORNL), and Ryan Ott (Ames)

Overview

The United States Department of Energy (DOE) National Laboratories are global leaders in scientific discovery and technological innovation, and considered the "crown jewels" of the nation's innovation and research ecosystem. The infrastructure of these laboratories, from laboratory space to critical utilities, is essential to enabling this success. Without significant investments and sustained leadership from the DOE, Congress, and the National Labs, this infrastructure will be increasingly unable to support the critical missions of the Department. In this think-piece, we offer a set of solutions designed to tackle the singular challenge of modernizing the infrastructure of the National Labs to ensure resiliency, foster safety, and achieve net zero carbon emissions.

Process

The authors engaged with a number of stakeholders and thought-leaders in the development of this think-piece, engaging with a cross-section of viewpoints, opinions and expertise related to the issues surrounding National Laboratory infrastructure. Recommendations were refined based on the input received from the following stakeholders:

- National Lab Operations Leadership:
  - Michael Brandt, Deputy Laboratory Director for Operations at Lawrence Berkeley National Laboratory (LBNL),
  - Julie Baker, Deputy Laboratory Director for Operations at the National Renewable Energy Laboratory (NREL)
  - Jeff Smith, former Deputy Laboratory Director for Operations at Oak Ridge National Laboratory (ORNL)
  - Jimmy Stone, Director of Facilities and Operations at ORNL
- External Experts:
  - Professor Sidney Shapiro, Frank U. Fletcher Chair in Administrative Law, Wake Forest University. Professor Shapiro is one of the leading experts in the United States on federal administrative law, including advisory committees created under Federal Advisory Committee Act (FACA).
  - Michael Bennon, Research Scholar, Global Infrastructure Policy Research Initiative, Freeman Spogli Institute for International Studies, Stanford University. Mr. Bennon is a recognized expert on domestic and international infrastructure policy, finance, and public-private partnerships.
- DOE Laboratory Operations Board – August 2022
- DOE Laboratory Operations Board Working Group on Laboratory Infrastructure – October 2022
- Juston Fontaine (SC-4) – Deputy Director for Field Operations

Challenges

The DOE National Laboratories provide cutting-edge fundamental and applied scientific research, developing problem solving technologies and delivering one of the Nation's most effective "on call" resources for tackling unprecedented energy, security, and environmental challenges. For decades, the infrastructure of the National Labs—from power and cooling systems to research and support facilities—has been underfunded through Congressional appropriations and departmental budgets. This dynamic has led to a significant and growing backlog of deferred maintenance across the National Lab complex, which was reported recently at $4.3 billion.[1] The increased focus around minimizing the carbon footprint ("net-zero carbon") creates additional pressure on the DOE and the laboratory contractors to deliver increased infrastructure investments while simultaneously increasing energy efficiency and reducing overall carbon emissions.

This acute need was noted in the 2015 report generated by the Commission to Review the Effectiveness of the National Energy Laboratories (CRENEL),[2] which identified key actions necessary to address critical facilities and infrastructure issues. This report concluded that: "DOE and the laboratories should continue efforts to improve laboratory facilities and infrastructure by halting the growth in deferred maintenance and speeding up the deactivation and decommissioning of excess facilities. DOE should work with Congress and the Office of Management and Budget (OMB) to agree upon the size and nature of the resources shortfall for facilities and infrastructure, and to develop a long-term plan to resolve it through a combination of increased funding, policy changes, and innovative financing."

DOE has made limited progress in addressing this recommendation, constrained by modest Congressional appropriations, departmental policy, statutory interpretations and budgetary priorities. While recent legislation from the CHIPS Plus Science Act and the Inflation Reduction Act provide authorization and some appropriations for national lab infrastructure, the significant and enduring challenge of laboratory infrastructure requires long-term and sustained strategic actions to achieve meaningful progress.

Recommendations

Through interviews with National Lab leaders and discussions with DOE, the authors have identified five strategic activities that address the infrastructure challenge at different time scales and levels of impact. Table 1 summarizes the recommendations and provides additional supporting details.

To begin advancing these strategic activities the authors recommend that the NLDC convenes a summit on National Laboratory Modernization to refine these recommendations and chart a path forward. Recommendations generated from this summit would be integrated into white papers used for policy change advocacy. Under the Oppenheimer Leadership Network (OLN), the authors are committed to organizing and facilitating the summit and fostering wide participation from the NLDC, the OLN and other appropriate stakeholders.

[1] Data compiled from the FY 2021 FIMS Snapshot and G2 BUILDER January 2022.
[2] See Final Report of the Commission to Review the Effectiveness of the National Energy Laboratories, Volume 1, October 28, 2015, page 57.

Table 1 - Summary of Recommended Solutions and Actions

Proposed Solution	Rationale	Recommended Actions
Support the commissioning of a Federal Advisory Committee Act (FACA) Committee or relevant advisory subcommittee to focus on Laboratory Infrastructure	Consensus recommendations to support bold action by DOE and Congress are needed to address the critical and enduring infrastructure challenge. Such consensus recommendations will support alternative financing mechanisms, provide sustained focus on the issue, and catalyze continued innovations in infrastructure modernization.	Working with the Laboratory Operations Board (LOB), support the commissioning and charge of Laboratory Infrastructure Modernization subcommittee of an existing FACA, or advocate for the commissioning of a standalone FACA for DOE National Laboratory Infrastructure Modernization. This will provide a Congressionally approved pathway for the executive branch to receive feedback from the laboratories on this issue.
"Swiss Army Knife": Best Practices Policy for Financing Laboratory Infrastructure Modernization	Funding of laboratory infrastructure projects consist of a number of varied options (ex. general plant projects (GPP), institutional general plant projects (IGPP), science laboratories infrastructure (SLI)). No options readily exist for alternative financing which are endorsed by the DOE and Congress	Creation of a "best practices" policy document for M&O contractors to pursue funding of laboratory infrastructure projects, including policies which permit pathways for alternative financing of laboratory infrastructure projects (ex. public-private partnerships, public utility partnerships for alternative funding of facilities) by the laboratory contractor.
Creation of a document which contains a 20-year vision for a modernized, net-zero carbon national laboratory complex.	Feedback from DOE leadership and laboratory stakeholders is that there is a challenge in selling the need for laboratory infrastructure modernization to Congress. A vision detailing the future of the laboratory complex and its modernization towards net-zero carbon is needed.	Similar to the Orbach Report ("Facilities for the Future of Science: a Twenty Year Outlook"), which was praised by Congress as an example of how federal S&T agencies should set their priorities,[3] a report providing a 20-year vision for laboratory infrastructure modernization towards net-zero carbon should be generated, which creates near-term, mid-term, and far-term goals to achieve the vision.

[3] Moving Ahead: DOE Office of Science Updates Its Facilities Report (available at https://www.aip.org/fyi/2007/moving-ahead-doe-office-science-updates-its-facilities-report), AIP Bulletin, October 17, 2007.

Develop a Community of Practice for Energy Service Agreement's (ESA) to streamline National Laboratories use of ESPCs and UESCs to implement infrastructure projects.	Complex contracts and long-planning processes are difficult to manage by limited resources at the Site Office level and often fall behind priority from contracting actions for appropriated and time limited funds.	Develop a community of practice for NL staff and DOE contracting officers to share best practices and training to improve the use of ESAs. Increased communication and coordination could also lead to bundling of contracts and cost savings on procurement and contract administration.
Establish a Net Zero Labs Infrastructure Committee to accelerate planning and implementation of key infrastructure investments needed to achieve net zero.	Closer coordination is needed between infrastructure planning and sustainability staff to ensure 10-year investment plans maximizes opportunities for decarbonization while aligning foundational infrastructure investments that advances S&T efforts aimed at solving decarbonization gaps. Best practices are not being widely collected and leveraged across the complex.	Establish a NLDC Committee made up of each laboratory's Chief Sustainability Officers and Infrastructure/Campus Planning Directors to drive planning and investments to addressing the Labs' infrastructure needs to address net zero and modernization goals. The committee could document and share best practices for planning and implementing infrastructure investments needed to achieve net zero. The committee could also craft messages and streamline communications from the National Labs to congress and DOE administration on how to promote the need for National Lab infrastructure modernization.

Appendix A: Summary of Cohort 5 Think-Piece Recommendations and/or Next Steps

Summary of Cohort 5 Think-Piece Recommendations and/or Next Steps	
White Paper Slides	**Identity and Awareness of the National Labs** • Charter the OLN committee for further development of the idea with a follow-up presentation at the NLDC Summer Retreat. • Advocate for the inclusion of a National Labs Identity and Awareness Building Campaign to be included within the scope of the activities of Foundation for Energy Security and Innovation (FESI). If FESI doesn't come to fruition, fully support determining one of the other six pathways noted in the think-piece.
White Paper Slides	**National Lab Conference** The NLC proposal is a big and potentially transformational idea which will require significant resources and full buy-in from stakeholders. These needs include: - Professional event organizer and IT support - Support for organizing committee members, which should be representative of 17 NLs - Support for NL staff to attend conference - Strong support from all 17 NLs and DOE - Importantly, the NLDC, DOE, etc. should attend and actively participate The request to the NLDC is full endorsement and support for an NLC.
White Paper Slides	**ENDLESS Frontiers: A Journal for the National Laboratories to Engage Stakeholders and the General Public** The request to the NLDC includes the following: - Endorsement of concept and permission to launch a pilot program - Resources to initiate pilot journal, including funding and/or logistical support - Support in identifying and standing-up an editorial team, including a chief editor, administrative and IT support, and editorial board - Support in standing-up an executive committee with one member rotating among NL communication officers The OLN will work to develop the following elements in coordination with the NLDC. - Provide an online platform for communication and information sharing - Establish a straw editorial board - Conduct a feasibility study and establish governing principles - Outline topics
White Paper Slides	**National Laboratories Explorers Program** • NLDC endorsement of program • Request for the NLEDC to develop an implementation plan • OLN and NLEDC to develop cost-sharing model • OLN to identify program champions • OLN to identify a hosting site • OLN and NLEDC to identify mechanisms to establish a subcontract for web presence and communication materials; implementation upon NLDC approval.

White Paper Slides	**The National Labs' Talent Opportunity Pool (TOP) Database** • **Review and Discussion**: Convene the NLCHROs, the NLCDOs, and the team at Zintellect to meet to further discuss TOP and determine a path for implementation. • **Create Working Groups**: Develop a set of working groups to focus on implementing different areas of TOP, meeting on a consistent basis to determine progress. • **Project Management**: Create a system that would hold the planning committee accountable for targeted deadlines and tasks.
White Paper Slides	**System Innovations in Benefits** • **Recommendation 1**: Improve awareness of current benefits - Establish a communication campaign to inform employees of existing benefits - Rework HR websites to advertise benefits clearly - Highlight lesser-known benefits in internal lab news or social media - Train managers to raise awareness of benefits with their teams • **Recommendation 2**: Alter current policy and contractual limitations on benefits - Remove or reduce DOE policy and contractual limitations on benefits, give LDs as much flexibility as possible - Charter a working group to provide recommendations - Establish a pilot at one or more labs to demonstrate viability of approach • **Recommendation 3**: Establish a system-wide HR vendor - Opt-in strategy for labs and employees - Labs can continue to offer benefits not available from system-wide vendor, e.g., a pension plan - Features: enables transfer of leave accrual and retirement plans; provide perks after employment ends • **Recommended Next Steps** - Make systemic change to benefits offerings a priority for lab leadership - Task the LOB HR Toolkit Working Group or other group to pursue the recommendations
White Paper Slides	**Ensuring a Diverse, Equitable, and Inclusive Operations & Research Culture Across the National Lab Complex** • **Recommendation 1**: Develop lab complex DEIA community standards and best practices • **Recommendation 2**: Expand lab complex diversity metrics to track progress over time and incorporate measures of inclusion • **Recommendation 3**: Integrate DEIA and energy justice into our daily research and operations work
White Paper Slides	**Innovation for Global Security** • Endorse idea; identify emerging areas for immediate investment (NLDC and CROs). • Hold inaugural meetings to nucleate the community, establish mechanism and scope. Pursue direct funding if feasible (OLN and NL experts). • Coordinate LDRD investments by several labs in each area selected (details provided in the Accelerating Innovation Through Multi-Laboratory LDRD think-piece) (CROs). • Organize workshops like Gordon conferences to engage external experts, discuss challenges, ideate, and build a community (technical leaders). • Transition from LDRD to sponsor funding and sustain the community of practice. Extend success to other areas (technical leaders).
	Accelerating Innovation through Multi-Lab LDRD Investments • Establish an annual planning process to identify candidate strategic themes

White Paper Slides	- Charter a cross-lab organizing committee to develop candidate themes - May delegate to OLN • Launch a pilot multi-lab investment based on an NLCRO-endorsed theme - Organizing team runs project scoping event - Review committee recommends at least one project to pilot involving 3+ labs • Support LDRD Program Managers in creating a governance structure - Administrative implementation will be specified by LDRD program manager team
White Paper Slides	**Overcoming Barriers for a Modern, Net Zero Carbon National Laboratory Infrastructure** Key recommendations include the following: • Develop a Community of Practice for Energy Service Agreements - Link up National Lab staff and DOE Contracting Officers - Share best practices, lessons learned - Accelerate adoption of ESA's for modernization • Establish a NLDC Net-Zero Lab Infrastructure Committee - Connect National Lab leaders working on net zero labs - Focus on critical path items for campus modernization needed to achieve net zero Requests of the NLDC include the following: • Refining the Policy - NLDC convenes a summit on National Laboratory Modernization. - Recommendations generated from workshops held during this summit are integrated into white papers used for policy change advocacy. - Members of OLN could organize, steer, and participate. • Unified Vision and Plan - Workshop during summit generates ideas which could be incorporated into 20-year vision. - Submitted to the LOB or other FACA-affiliated committee • Enhanced Collaboration - NLDC convenes a Net Zero Laboratory Infrastructure Committee. - Focus on collaborative aspects of the recommendations, including ESAs and developing actionable net-zero carbon infrastructure plans for the labs.

Appendix B: Think-Piece Presentations Delivered to the NLDC During the OSELP 2022 Capstone

The following presentations were delivered to the NLDC and CROs by the Oppenheimer Cohort 5 fellows during their capstone event in Washington, D.C. on December 13, 2022. While this final think-piece report contains 10 think-pieces from Cohort 5, there are only 9 presentations as the think-pieces on "Innovation for Global security" and "Accelerating Innovation Through Multi-Lab LDRD Investments" were combined into a single presentation.

2022 Think-Piece Presentations
Click on title to access the presentation for a specific think-piece.

- Identity and Awareness of the National Labs
- National Lab Conference
- ENDLESS Frontiers: A Journal for the National Laboratories to Engage Stakeholders and the General Public
- National Laboratories Explorers Program
- The National Labs' Talent Opportunity Pool (TOP) Database
- System Innovations in Benefits
- Ensuring a Diverse, Equitable, and Inclusive Operations & Research Culture Across the National Lab Complex
- Innovation for Global Security (combined presentation)
- Accelerating Innovation Through Multi-Lab LDRD Investments (combined presentation)
- Overcoming Barriers for a Modern, Net Zero Carbon National Laboratory Infrastructure

Think-Piece Presentation to the National Laboratory Directors' Council on December 13, 2022
Forrestal, Washington, D.C.

Identity and Awareness of the National Labs

Chelsey Aisenbrey (Ames), Kate Anderson (NREL), Julie Carrera (ANL), Bill Pike (PNNL), Jonathan Russell (SLAC), Dolores Sanchez (SNL), Tracy Spooner (PNNL), Laura Stonehill (LANL), and Robert Wagner (ORNL)

View White Paper

Return to Think-Piece Presentation Links

Establishing an **Identity** for and Enhancing the **Awareness** of

THE NATIONAL LABORATORIES

Presented to the National Labs Directors Council by:

Chelsey Aisenbrey
Kate Anderson
Julie Carrera
Bill Pike
Jonathan Russell
Dolores Sanchez
Tracy Spooner
Laura Stonehill
Robert Wagner


THE NATIONAL LABS

Most members of the public do not understand what the DOE National Laboratories do, or what a critical role they play in the nation's security and economic vitality.

-2015 CRENEL Report

Each of the Labs has an Established Identity





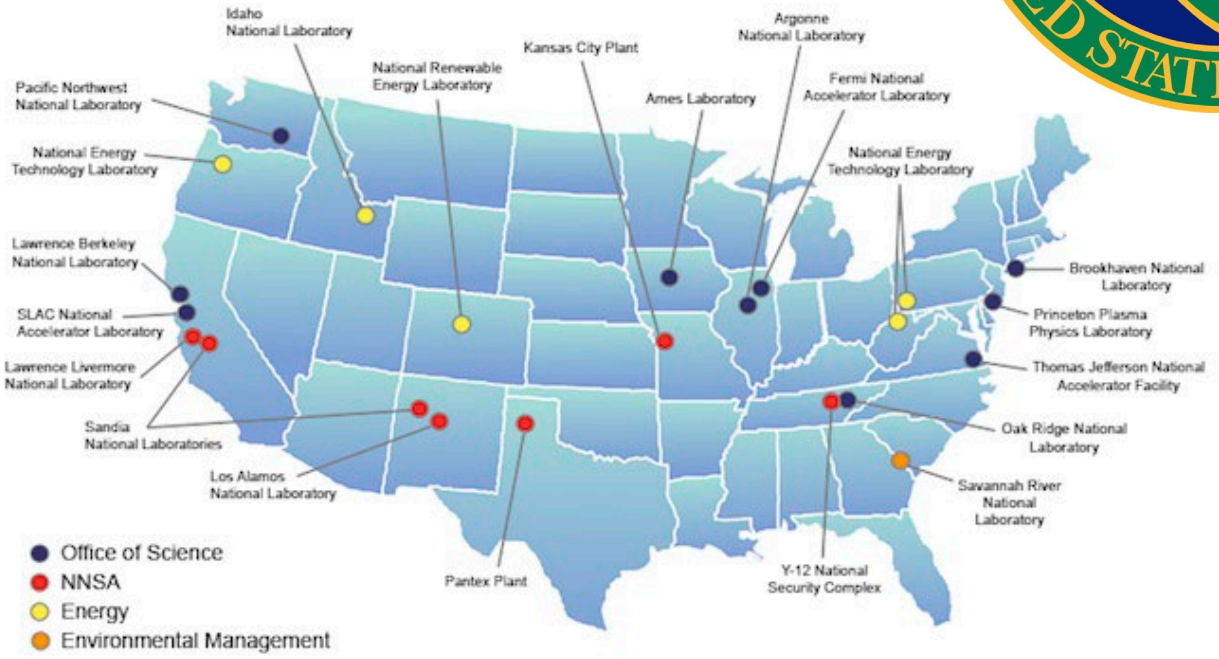


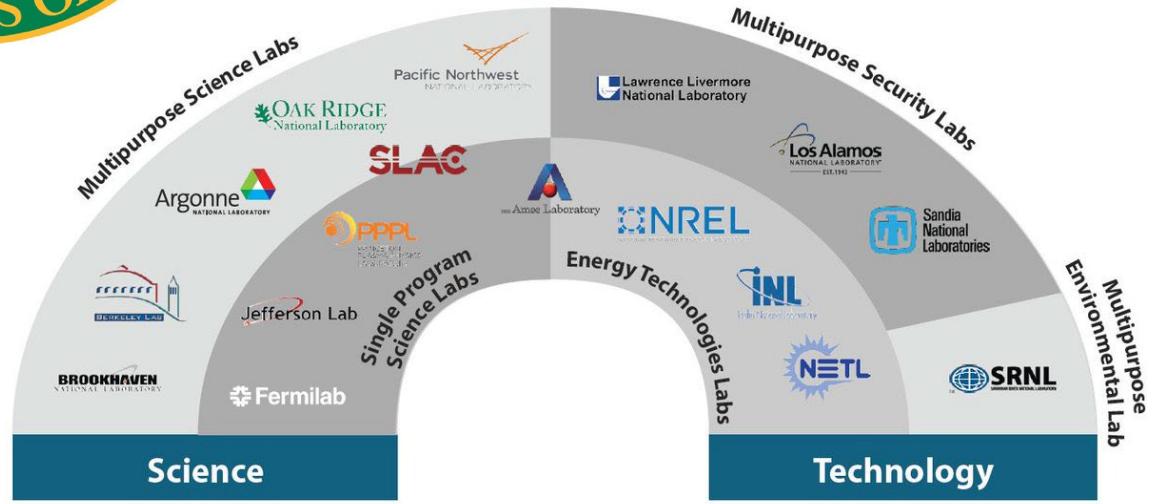






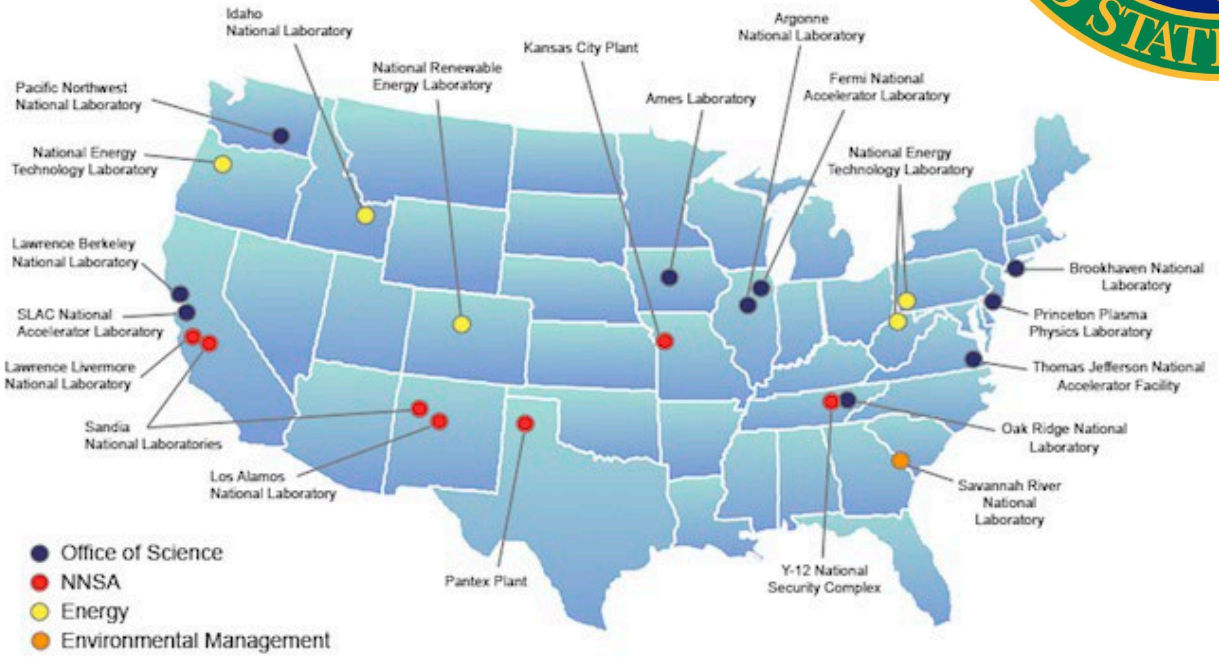

What Message is being Conveyed on the Importance of The National Labs

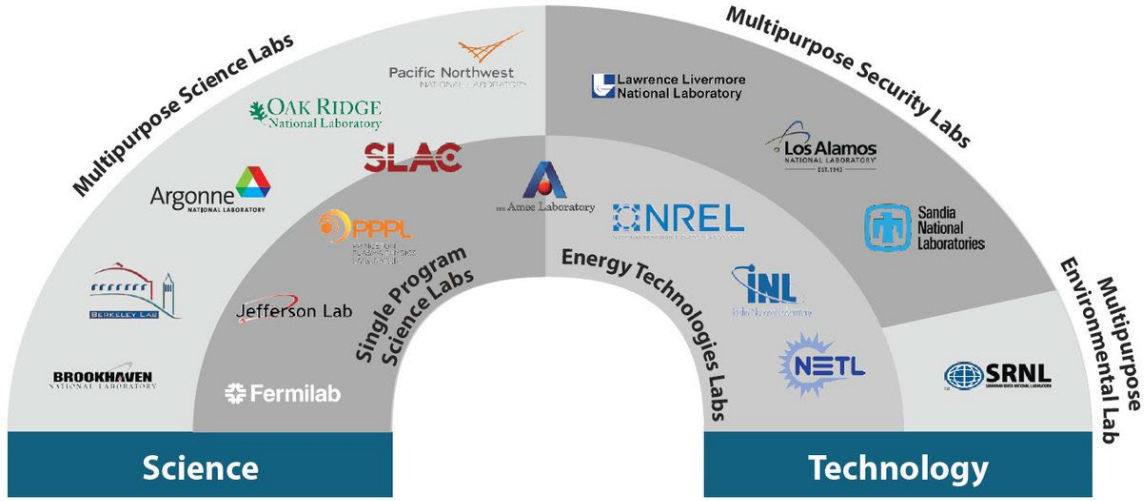




An identity should convey vision, **emotion**, and intent
It should be **simple**, direct and encompassing
It should be aspirational or **inspiring**

We are missing the mark on emotion, simplicity, and inspiration





THE NATIONAL LABS

What are the barriers to establishing a unified, simple, emotional, and aspirational National Lab identity?

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1. Establishing a strong identity for a federal institution is difficult

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3. Lab missions are too diverse to establish a central theme

What are the barriers to establishing a unified, simple, emotional, and aspirational National Lab identity?

1. Establishing a strong identity for a federal institution is difficult
2. A complex identity would detract from the individual lab identities
3. Lab missions are too diverse to establish a central theme
4. **There is no clear owner of a National Lab Identity**

Myth 1: Establishing a Strong Identity for a Federal Institution is too Difficult

FBI

Peace Corps

MARINES

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

THE UNITED STATES SECRET SERVICE

How Federal Institutions with Strong Identities Don't Communicate

The Department of the Interior

The Department of Justice

FBI

The State Department

Peace Corps

The Department of Health and Human Services

CDC

CENTERS FOR DISEASE CONTROL AND PREVENTION

Homeland Security's

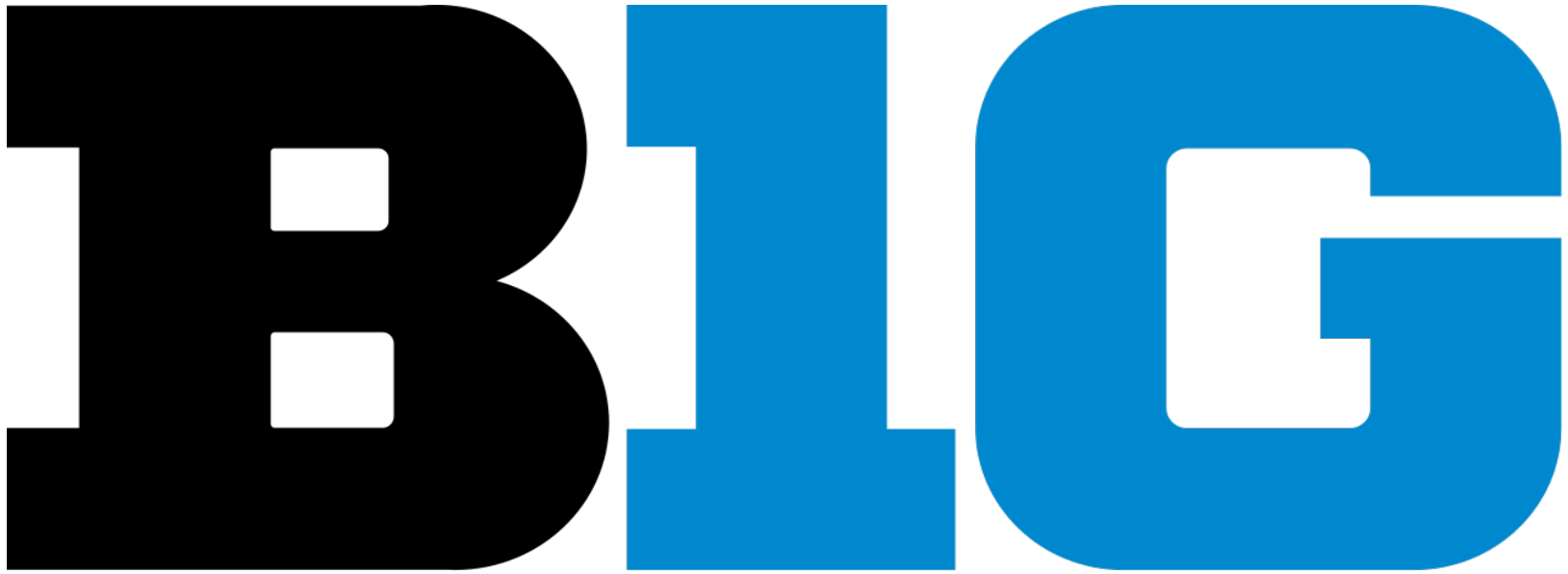
THE UNITED STATES SECRET SERVICE

The Department of Defense

MARINES

Myth 2:

Establishing a more prominent identity for the National Lab complex will take something away from each of the individual lab identities


B1G






BIG

University of Illinois
Indiana University
University of Iowa
University of Maryland
University of Michigan
Michigan State University
University of Minnesota

University of Nebraska
Northwestern University
Ohio State University
Penn State University
Purdue University
Rutgers University
University of Wisconsin







Myth 3:

The National Lab Complex is too diverse with too many missions to be able to communicate a unified identity

Six very Different Locations Bound Together by a Common Identity

Core Challenge:

The issue of ownership and oversight

Who has primary responsibility to establish, own, resource and maintain a complex-wide identity over time

Today's Answer: No one

Potential Owners of a National Lab Identity

Potential National Labs Identity Owner	Advantages	Disadvantages
The National Labs Directors Council	• Proximity to mission • Existing group • Previous effort in this area	• Limited capacity • Limited unrestricted funding • Not an Incorporated or legal entity
The Department of Energy	• Availability of Funding • Own existing lab brands • Existing rebranding effort	• National Labs identity is secondary objective • Lack of significant progress to date • Existing DOE identity is confusing to public
The National Labs Communications Officers Group	• Proximity to mission • Communications expertise	• Lack of time/capacity • Limited unrestricted funding • National Labs identity secondary to home lab
A Volunteer Lab, or Lab Rotation Schedule	• Proximity to mission • Communications expertise	• Lack of time/capacity • Limited unrestricted funding • National Labs identity secondary to home lab • Risk of changes in lab leadership/support • Messaging influenced by home lab mission • Administrative burden of cost recovery
A New National Labs Foundation	• Proximity to mission • Ability to solicit external funding	• Effort to stand up new non-profit entity • Potential difficulty gaining DOE permissions to use lab identities
The Oppenheimer Leadership Network	• Proximity to mission	• Reliance on volunteers would impact sustainability • Limited unrestricted funding • Lack of time/capacity • Mass communications expertise limited • Potential issue of oversight or empowerment
Foundation for Energy Security and Innovation	• No Funding Restrictions • Ability to solicit external funding • Foundation likely to be established • Communications expertise can be procured	• Lack of direct proximity to lab mission • Mission of FESI is related to building awareness of the National Labs, but not a perfect mission fit

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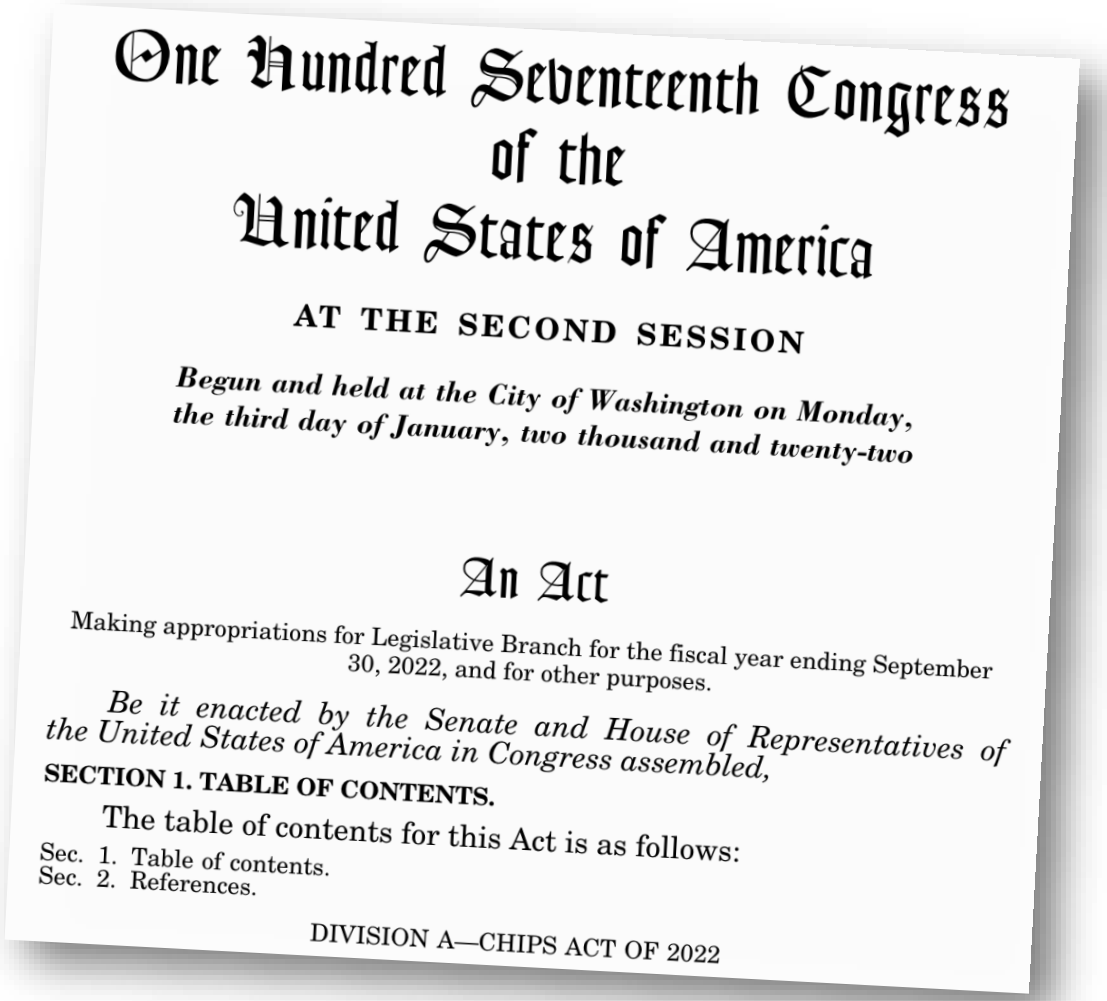
Foundation for Energy Security & Innovation	• **No Funding Restrictions** • **Ability to solicit external funding** • **Foundation likely to be established** • **Communications talent can be procured**	• **Lack of direct proximity to lab mission** • **Mission of FESI is related to building awareness of the National Labs, but not a perfect mission fit**

The Chips Act Established the Foundation for Energy Security and Innovation (FESI)

The mission of FESI

A. To support the mission of the DOE

B. Advance collaboration with energy researchers, institutions of higher education, industry, and nonprofit and philanthropic organizations to accelerate the commercialization of energy technologies.



One Hundred Seventeenth Congress
of the
United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the third day of January, two thousand and twenty-two

An Act

Making appropriations for Legislative Branch for the fiscal year ending September 30, 2022, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. TABLE OF CONTENTS.

The table of contents for this Act is as follows:

Sec. 1. Table of contents.
Sec. 2. References.

DIVISION A—CHIPS ACT OF 2022

THE NATIONAL LABS

Our Recommendations to the NLDC

Charter this committee for further development of the idea with a follow-up presentation at the NLDC Summer Retreat.

Advocate for the inclusion of a National Labs Identity and Awareness Building Campaign to be included within the scope of the activities of FESI. If FESI doesn't come to fruition, fully support determining one of the other six pathways.

Our Commitment to the NLDC

Our continued involvement in the establishment of a National Labs Identity

Any Questions?

THE NATIONAL LABS

Think-Piece Presentation to the National Laboratory Directors' Council on December 13, 2022
Forrestal, Washington, D.C.

National Lab Conference

Mei Bai (SLAC), Ian Cloët (ANL), Sydni Credle (NETL), Thomas Yong Han (LLNL), and Robert Wagner (ORNL)

View White Paper

Return to Think-Piece Presentation Links

National Lab Conference

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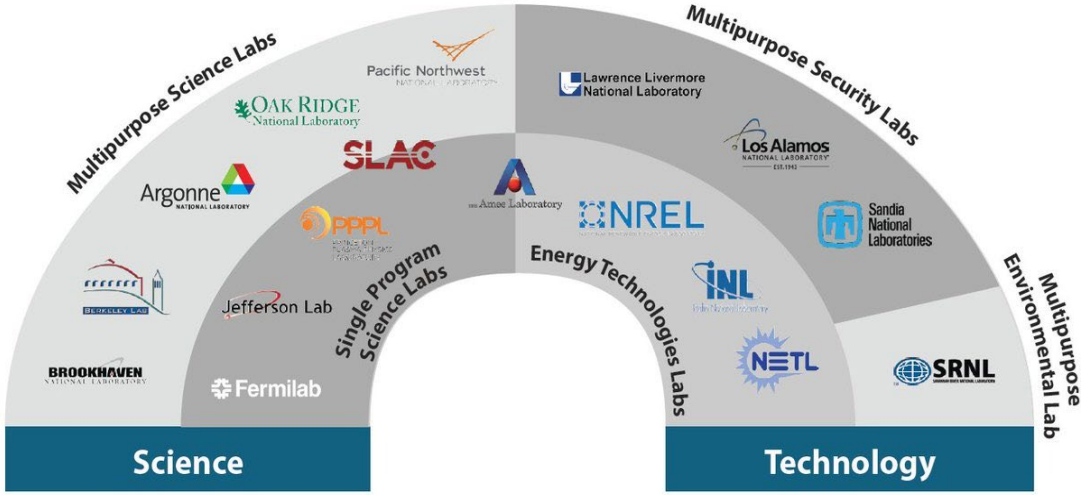


National Labs are Complex

New NL staff often take years to understand significant opportunities and fully engage

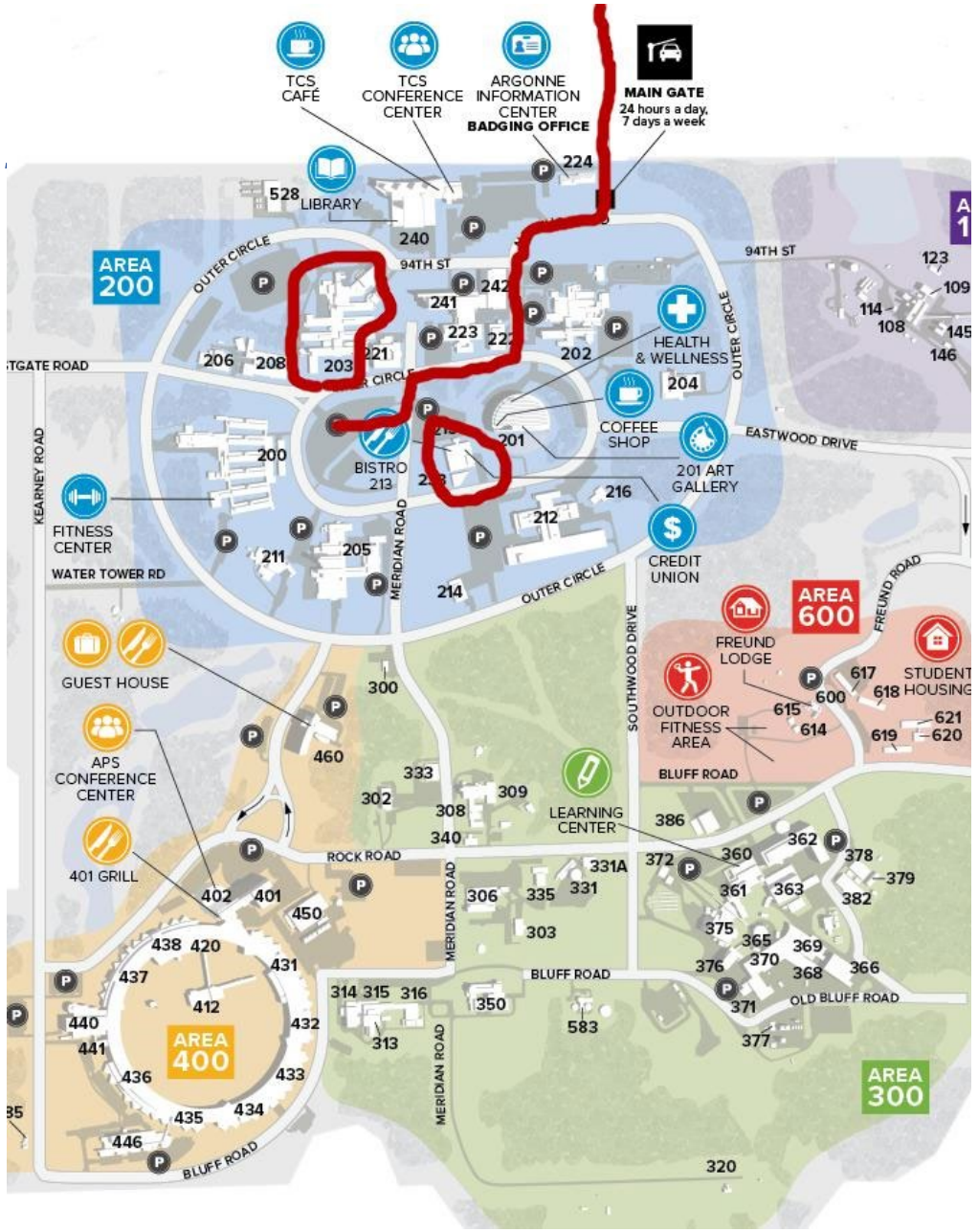
Usual to spend first 5-10 years just interacting with colleagues in group and division

- Little knowledge about what is happening across one's Lab or at most other Labs

NLs may be underutilizing talents and energy of early/mid-career (EMC) staff

- Not ideal for creativity, retention, DEIA, etc.

Need to better guide EMC staff to think big, build collaborations across the NLs, and develop a bold vision for their careers as part of the NL complex

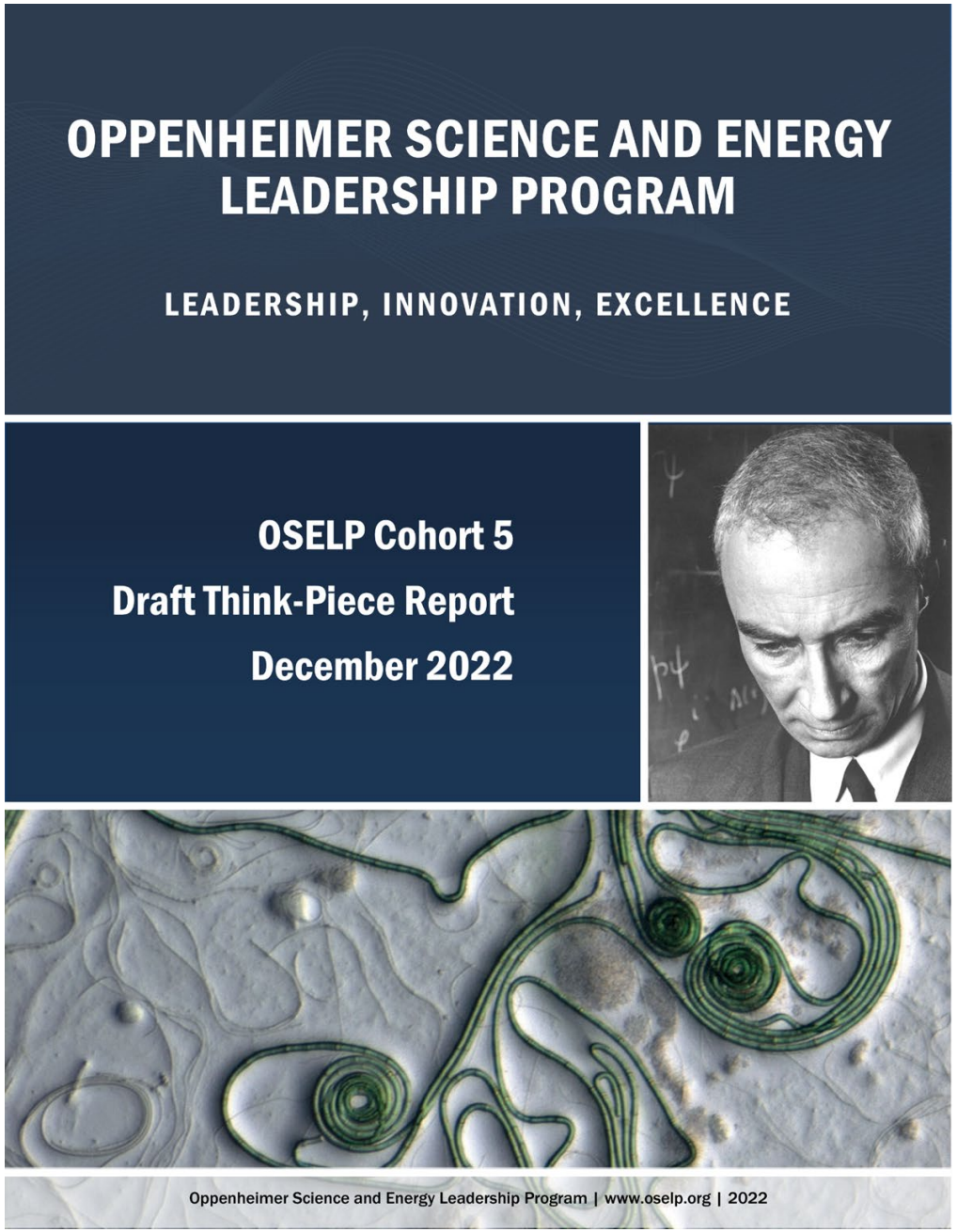


OSELP (*like*) for Everyone

The OSELP has a profound impact on its cohort members

- Provides impetus to reimagine and expand vision for NL system and one's role within it
- Comprehensive, with all 17 NLs
- High-level, with excellent opportunities to engage with Lab leadership/management, and learn about priorities and strengths
- Cohort members represent broad aspects of the NLs – science, technology, and operations

Need a mechanism to broadly bring these benefits to all staff and student members of the NLs – so that everyone is encouraged and supported to think big



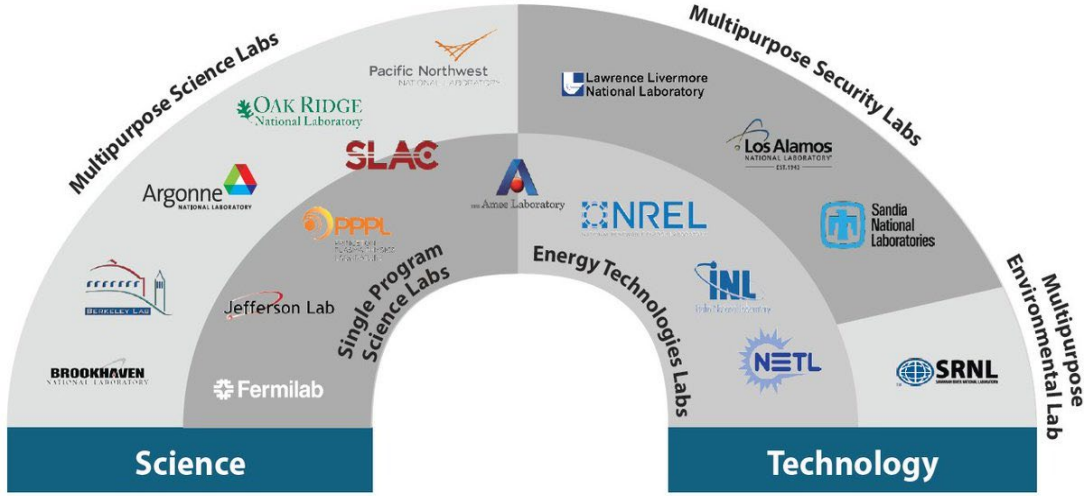
National Lab Conference (NLC)

To bring the broad benefits of OSELP to *everyone* in NL system we propose a NLC

NLC will take a grassroots/bottoms-up approach to planning and implementation

- Will empower EMC staff to think big and bring ideas to the NLC for discussion
- Structured to encourage high amount of open dialogue, interaction, & collaboration
- Strong involvement from NLDC, DOE, etc.

Similar in spirit to the Big Ideas Summit series but completely different approach and emphasis – all NL staff and students are welcome, especially those at the early/mid-career level



Unique Concept – Idea Booths & Voting

A key goal for the NLC is to be an *ideas factory* or *festival of ideas* for the NL complex

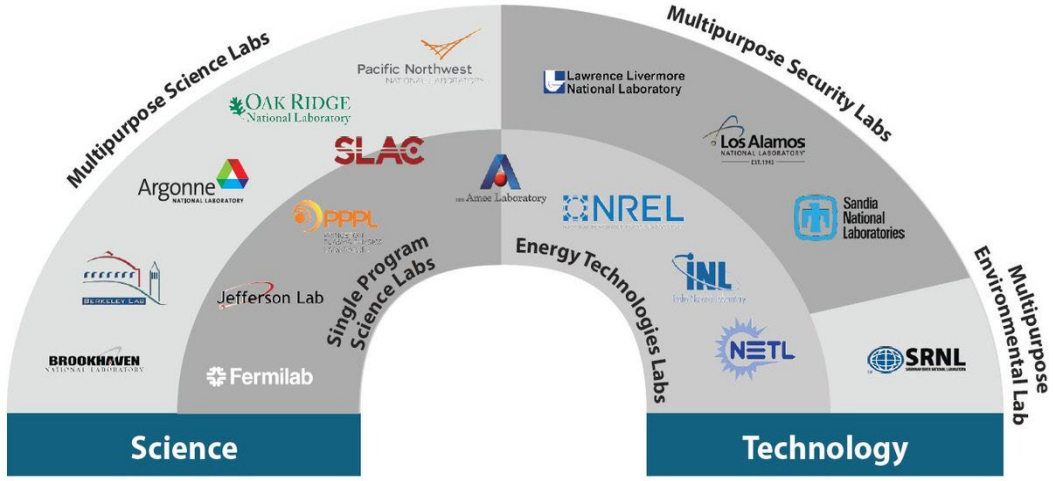
NLC cycle would begin with an open call across all 17 NLs for (big) ideas/think pieces

- Blind vetting by OC and NL members via online portal (up/down voting) – categories of science, technology, and operations

Individuals/teams would present think pieces in "Idea Booths" reminiscent of a trade show

- Attendees, NLDC, etc. would vote/score favorite ideas and the top ideas in each category would close the conference

The idea booth concept is unique to a conference of this type (to best of our knowledge)



NLC – Idea Booths but also Much More

Idea Booths are a central concept for the NLC but there would be much more

- NLC would begin with inspirational talks on NL science, technology, and operations
- Discuss grand scientific and technological questions and challenges addressed at NLs
- Discuss challenges and successes in operations, e.g., DEIA, infrastructure, etc.
- Social events to engage with NL Directors, leaders in science, technology, & operations

Each facet of NLC is designed to showcase the opportunities at the NLs, give attendees the knowledge to navigate them, and empower staff to build a big vision for their careers with the NLs

Program Guide

Opening event
- **Keynote speakers**
- **Highlights from NLs**

Program of Areas
- S&T Booth program
  - Booth 1
  - …
- Mission Support Booth program
  - …
- DEI Booth program
  - …

After hour social programs
- Science Ted talk
- Scientists meet Infrastructure
- Early careers meet NL Directors
- …

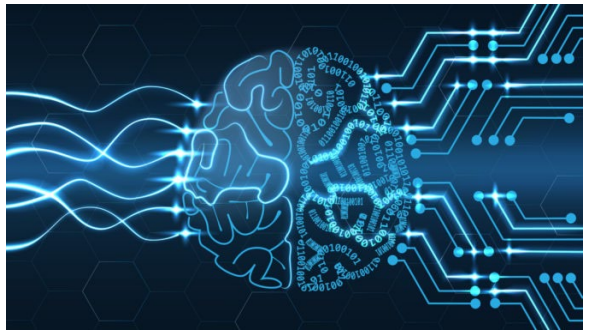
Closing event
- **Award session: best idea booth**

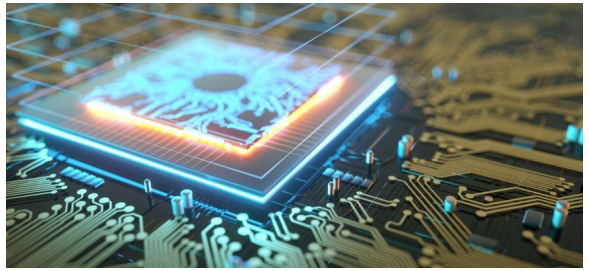
Broad Benefits of a NLC

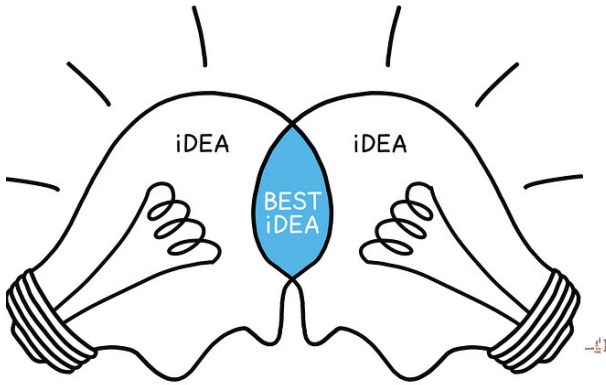
Tremendous need for a NLC, which would bring many broad benefits

- Tap into the energy and ideas from EMC staff to increase impact of NL complex
- Elevate discussions where all 17 NLs are participating at the grassroots, e.g., DEIA
- Help develop NL identity, awareness, and sense of belonging
- Foster organic collaboration between NLs
- Improve staff retention and recruitment by increasing engagement with the NLs

NLC will empower NL members to build a bigger vision for their careers, develop networks and relationships, and increase impact of NL system





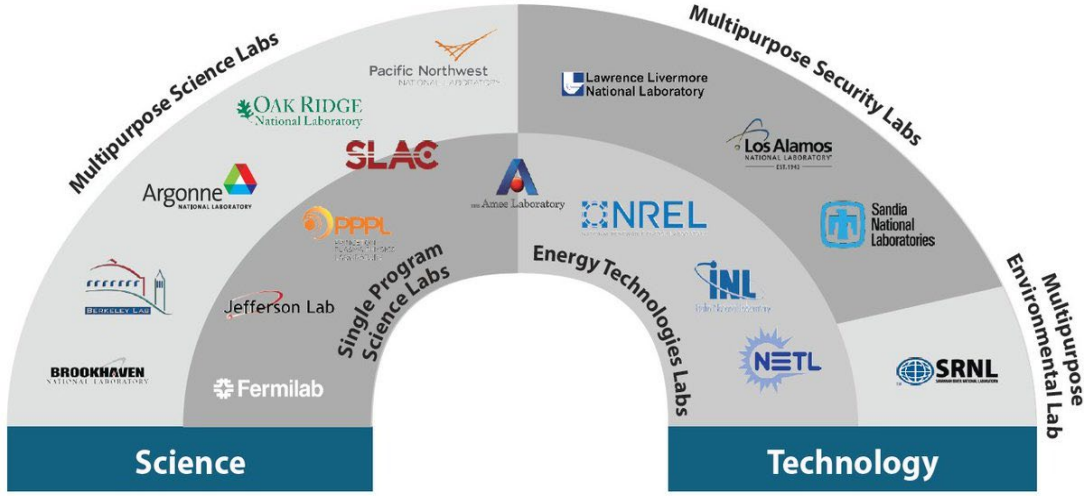


Ask to NLDC

NLC is a big and potentially transformational idea, which requires significant resources and full buy-in from stakeholders

- Professional event organizer and IT support
- Support for organizing committee members, which should be representative of 17 NLs
- Support for NL staff to attend conference
- Strong support from all 17 NLs and DOE
- Importantly, the NLDC, DOE, etc. should attend and actively participate

Our ask to the NLDC is full endorsement and support for a NLC



Think-Piece Presentation to the National Laboratory Directors' Council on December 13, 2022
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ENDLESS Frontiers: A Journal for the National Laboratories to Engage Stakeholders and the General Public

Mei Bai (SLAC), Ram Devanathan (PNNL), Kevin Doran (OSELP), Jamie Dunlop (BNL), Ryan Ott (Ames), Bill Pike (PNNL), Dolores Sanchez (SNL), Sanjaya D. Senanayake (BNL), Francesca Toma (LBNL), and Robert Wagner (ORNL)

View White Paper

Return to Think-Piece Presentation Links

ENDLESS FRONTIERS:

The Journal that Links Us All

national laboratories

Mei Bai (SLAC), Ram Devanathan (PNNL), James Dunlop (BNL)

William Pike (PNNL), Dolores Sanchez (SNL), Sanjaya Senanayake (BNL)

Francesca Toma (LBNL), Robert Wagner (ORNL)

U.S. DEPARTMENT OF ENERGY

Unite

Communicate

Reflect

Highlight

Network

What?

Quarterly published DOE NL-wide journal focused on research and operations breakthroughs, mission impacts, lessons learned, and other topics as prioritized by NLs

Who?

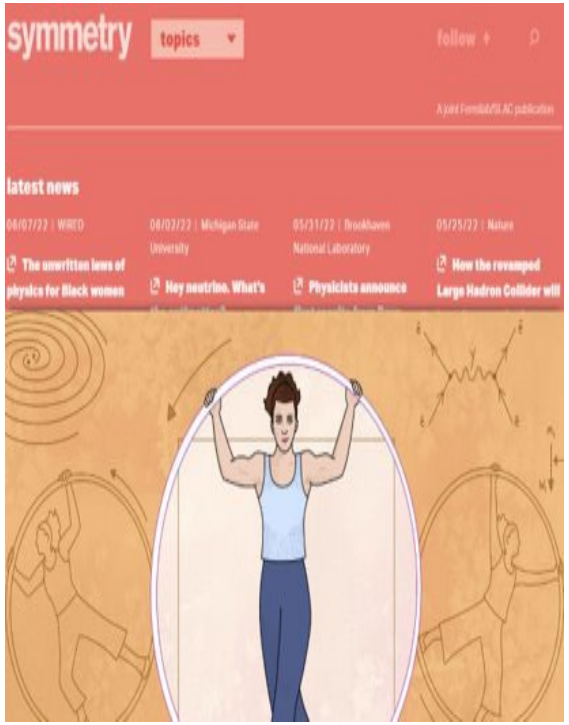
Led by Oppenheimer Leadership Network (OLN) members
For all national laboratory staff with future opportunity to extend to stakeholders and public

Why?

To **foster communication** and **drive awareness** and **collaboration** spanning research and operations across the national laboratories

Publication Examples

SLAC/FNAL Journal



SNL Accomplishments

Battelle Labs

National Academy of Engineering

Vision / Mission

- Propagate **best practices** of NLs across complex.
- **Highlight, document and archive** innovations and impacts of NL S&T Mission.
- Promote **objective reflection** over common concerns
- Provide **bridge for** cross-cutting **collaboration** at the **grassroot level**
- Showcase **strengths of NL -** Internal and External

Impact

- **Deeper and proactive engagement** to retain talents
- More **cross-cut communication and teaming** among NLs, from **research** to **mission support** topics
- Inclusive capability to facilitate broad **strategic development**
- Stronger **awareness of NLs** and advocate **mission**

Challenges

- **Finding right style** to showcase NL capabilities and achievements
- **Ensuring open dialogue** and avoiding non-constructive criticisms
- **Representing fairly and equally** all seventeen NLs
- **Reaching a design to complement** existing communication channels
- **Obtaining funding resources** for sustainable operation
- **Establishing/maintaining legal requirements** such as copyright

Ask

Request from the NLDC

- Endorsement of concept and permission to launch pilot program
- Resources to initiate pilot journal – funding and/or logistics
  - Editorial team: chief editor, admin and IT support, editorial board
  - Executive committee with one member rotating among NL communication officers

Request from the OLN

- Provide venue for communication and information sharing
- Establish editorial board
- Conduct feasibility study and establish governing principles
- Outline topics

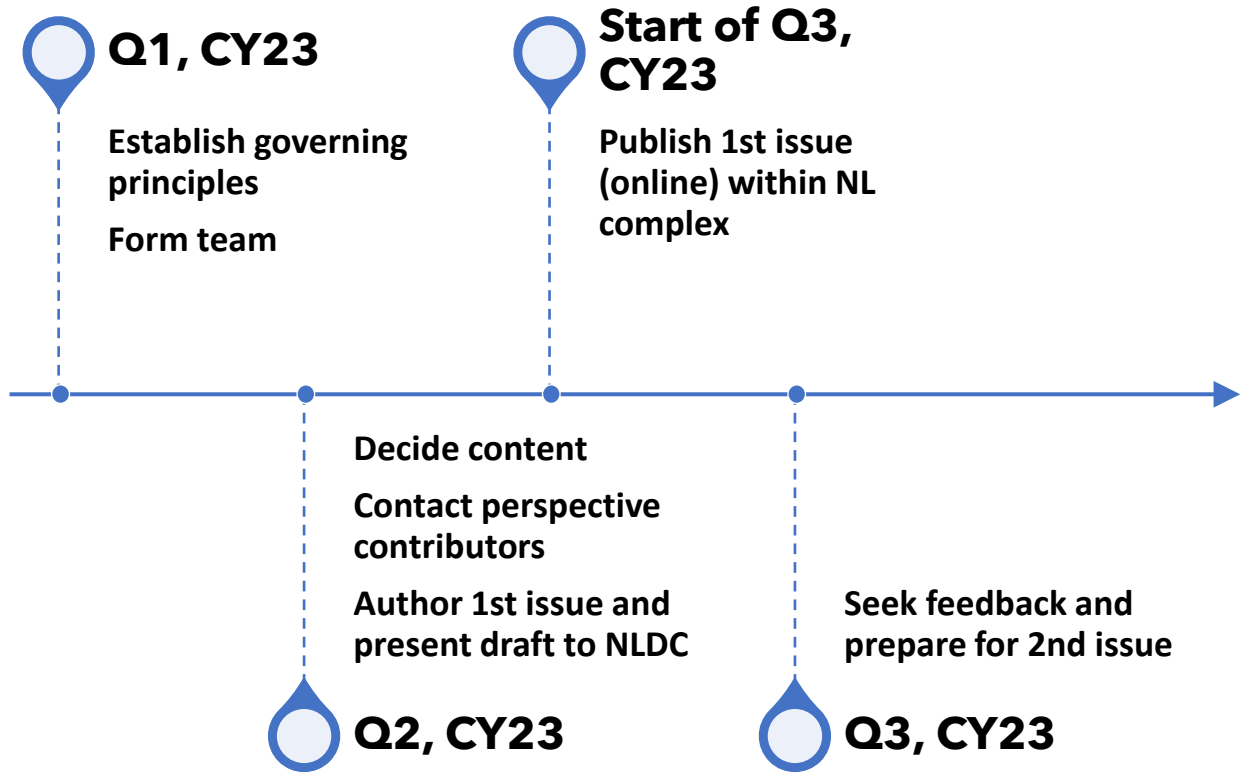
Pilot Program

Pilot program to address:

- Governing principles and organizational logistics
- Legal framework for copyright and ownership

Launch the 1st Issue

- Confirm theme and contact perspective contributors



Example topics for first issue

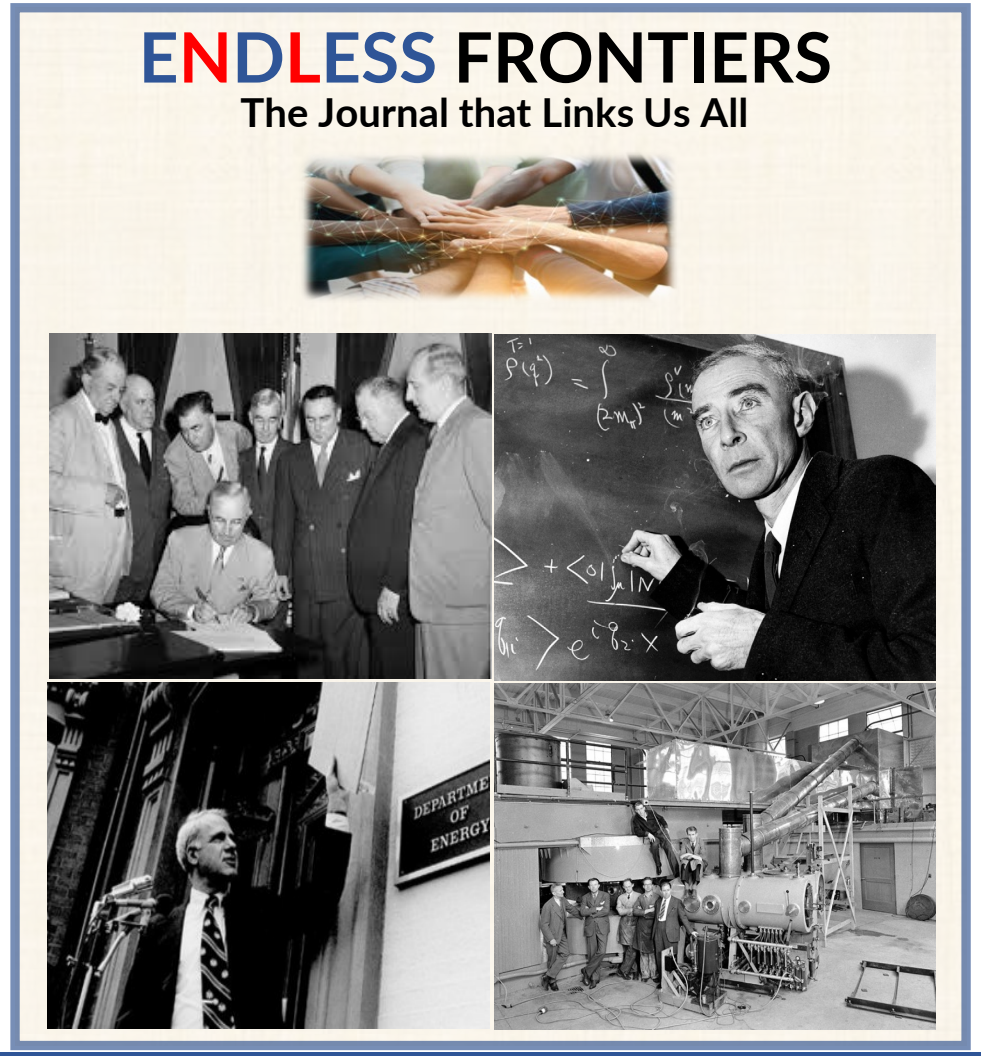
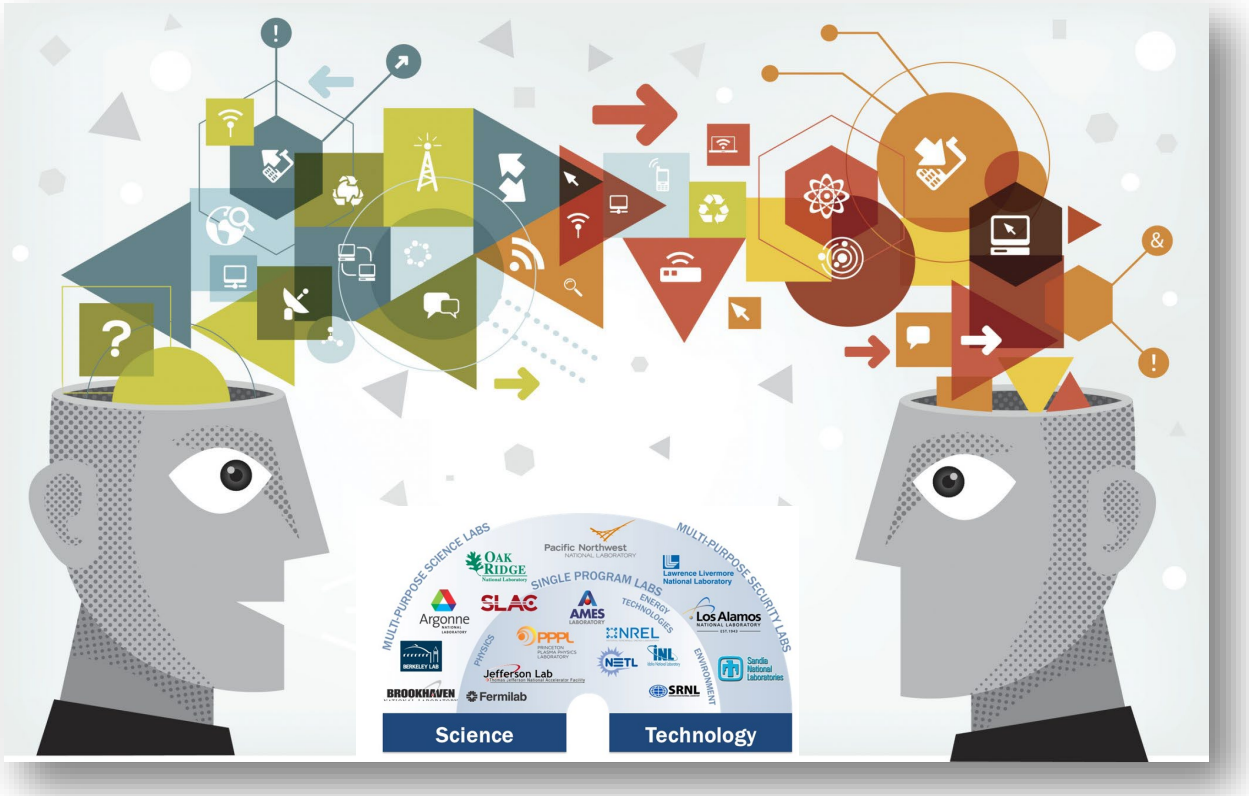


Table of Contents

Editor's Perspective	About this journal
Features	**Historical Impact of DOE National Laboratories** **Case Study**: Cross-lab collaboration **Analysis**: International collaboration in a challenging geopolitical era
Highlights	• A unified approach to addressing carbon-zero infrastructure
Initiatives	• Creating a DEIA Culture • Innovative idea seeking collaborators
DOE/NL 101	• History, funding, policy, keynote message • OLN discussion corner



"Communication leads to community, that is, to understanding, intimacy and mutual valuing."

-Rollo May

Think-Piece Presentation to the National Laboratory Directors' Council on December 13, 2022
Forrestal, Washington, D.C.

National Laboratories Explorers Program

Liz Hoffman (SRNL), Jon Russell (SLAC), Catherine Hurley (ANL), and Kevin Doran (OSELP)

View White Paper

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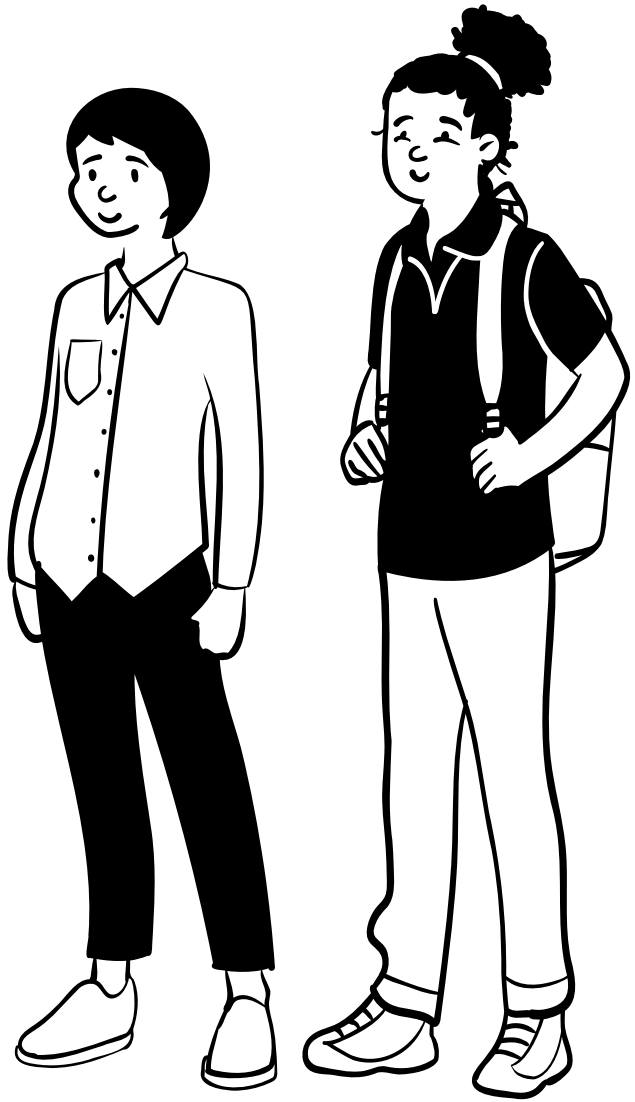
National Laboratories Explorers Program

A Virtual Journey for High School Students to Explore National Laboratory Career Possibilities

Liz Hoffman, SRNL

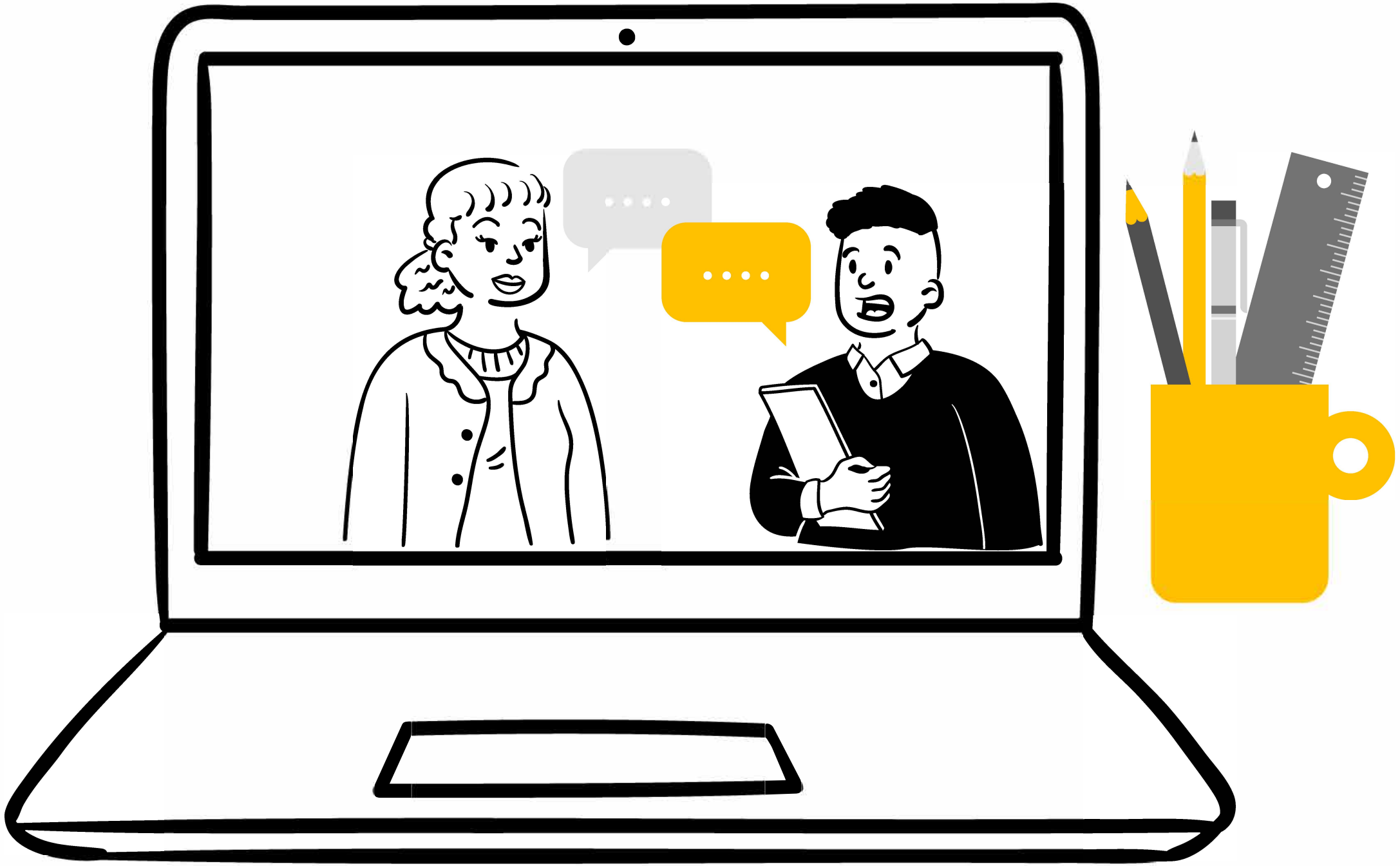
Jon Russell, SLAC

Catherine Hurley, ANL




You would enjoy the National Laboratory Explorers Program!
Midterms are next Tuesday


http://www.nationallaboratoryexplorers.org
National Laboratories Explorers Program
Available Programs
Saturday Morning Physics.....FERMI
Physics with Phones.....LLNL
Live Science.....LBNL
Science on Saturday.....PPPL
Behind the Science.....SRNL
scroll for more programs...



Attention: National Laboratory Explorers!

Click the link below to register completion of this online session!

www.nationallaboratoryexplorers.org

The Completion Code for this Event is: **WAY2GO!!!**

http://www.nationallaboratoryexplorers.org

Welcome Back National Laboratory Explorer!

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5 Points Collected!

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National Laboratories Explorers Program

Available Programs

Saturday Morning Physics.....FERMI

Physics with Phones.....LLNL

Live Science.....LBNL

Science on Saturday.....PPPL

Behind the Science.....SRNL

scroll for more programs...


42

Attention: National Laboratory Explorers!

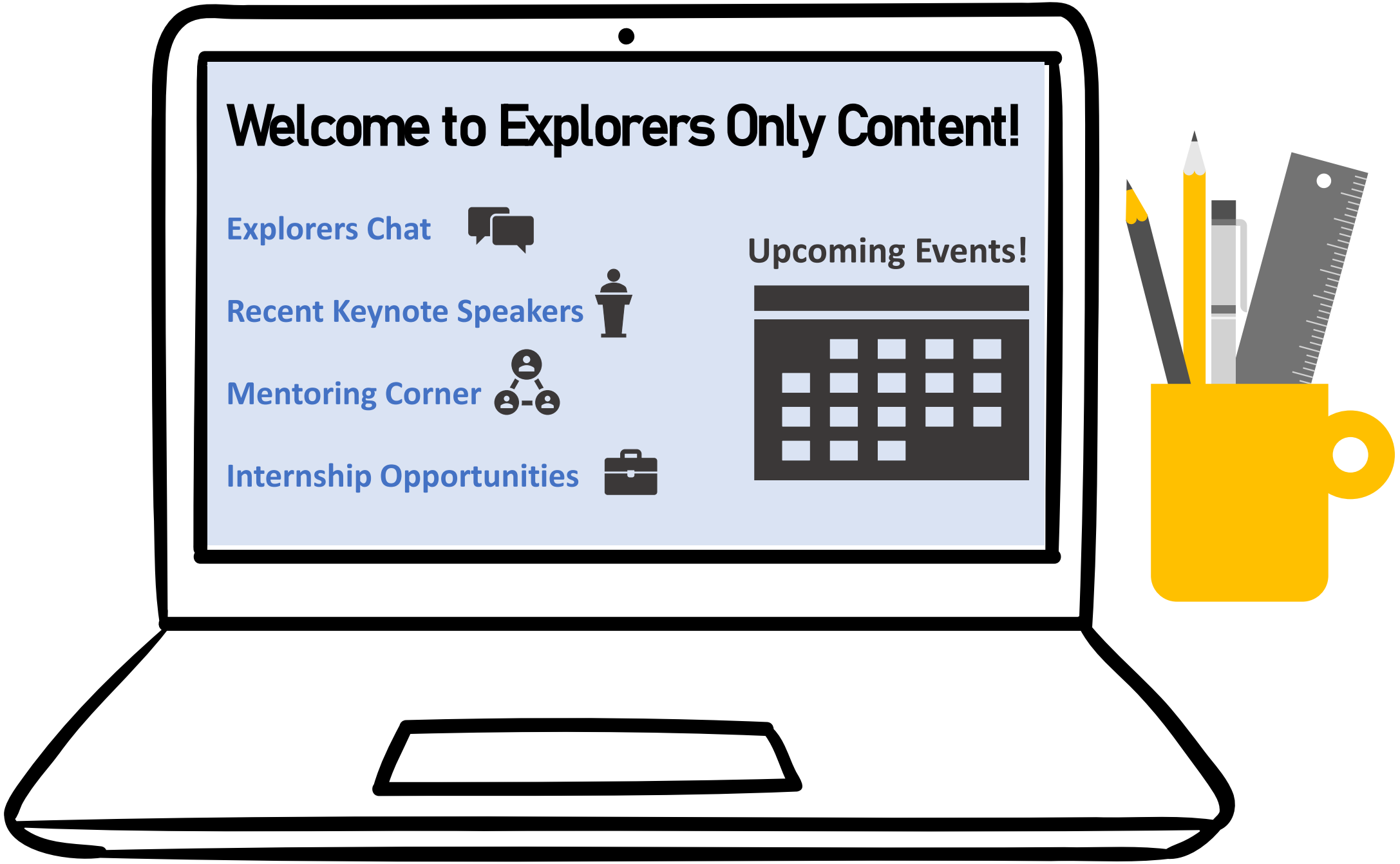
Click the link below to register completion of this online session!

www.nationallaboratoryexplorers.org

The Completion Code for this Event is: **U-R-AWESOME!!!**


http://www.nationallaboratoryexplorers.org
Welcome Back National Laboratory Explorer!
Click the Logo Below to Log Your National Laboratory Explorers Program Experience!


Congratulations!
You just leveled up and have access to National Laboratories
Explorers Only Content!


Welcome to Explorers Only Content!
Explorers Chat
Recent Keynote Speakers
Mentoring Corner
Internship Opportunities
Upcoming Events!

Increasing Interest to Pursue National Laboratory Careers

Augment access to existing National Laboratory education outreach programming

- Repeat engagement builds familiarity and trust
- Laboratories will benefit from expanded network of students

Utilize gamification to promote student interest

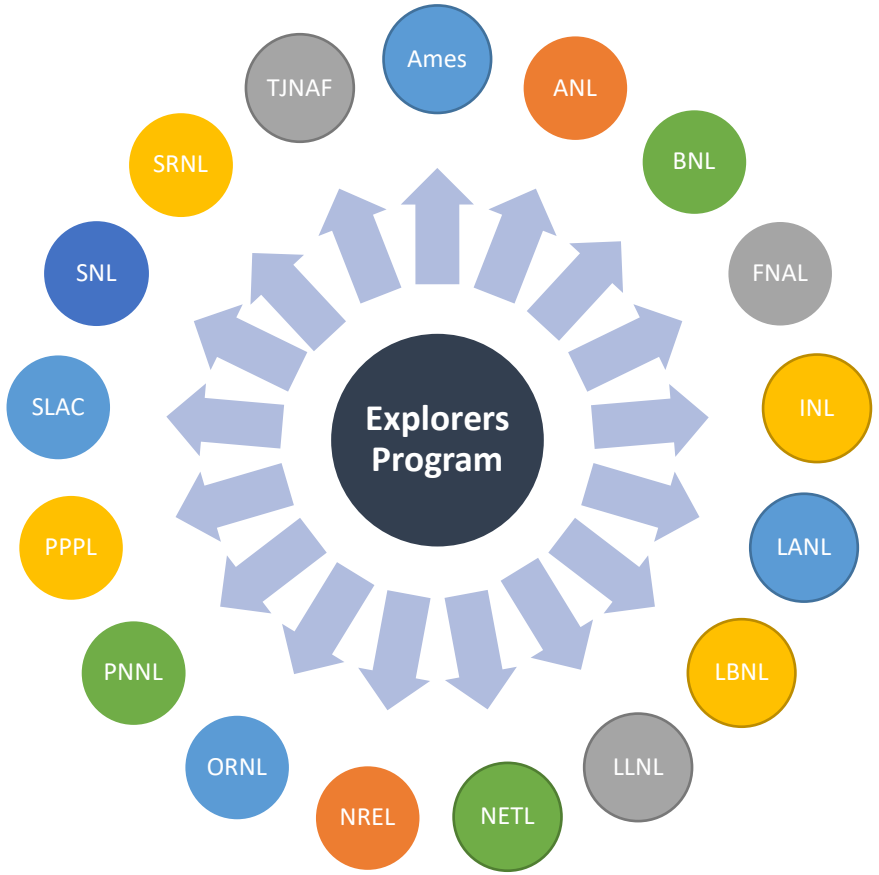
- Points system adds sense of accomplishment
- Successful achievement of *Explorers Only* content builds confidence
- *Explorers Only* content fosters social interactions and community

Impact students beyond Explorers Program

- Certificate to list on applications to post-secondary education
- Mentorship opportunities
- Internship postings

Key Attributes of Participating Education Programs Content

- **High school level** to ensure all participants are appropriately engaged.
- **Virtual/Hybrid** offers increased accessibility across the country.
- **Non-trivial** dives deep into focused science topics.
- **Inclusive** to all interested students.



Actions to Attract the Future Workforce Pipeline

- Curate a list of established virtual educational programs
- Design and build web presence for Explorers Program
- Develop communications to promote Explorers Program
- Connect with secondary education STEM professionals
  - Leverage existing connections with regional districts
  - Develop new connections with underrepresented districts
- Develop and schedule *Explorers Only* content

Recommendations

- NLDC endorsement of program
- Request for NLEDC to develop implementation plan
  - Determine cost sharing model
  - Identify program champion
  - Identify hosting site
  - Establish subcontract for web presence and communication materials

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Forrestal, Washington, D.C.

The National Labs' Talent Opportunity Pool (TOP) Database

Natalie Holder (SLAC), Stephen Smith (JLAB), Liz Hoffman (SRNL), Juliana Fessenden (LANL), Jao van de Lagemaat (NREL), and Tracy Spooner (PNNL)

View White Paper

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THE TALENT OPTIMIZATION PROJECT (TOP):
CREATING A NATIONAL LABS' SHARED RESUME DATABASE

Offering a concentrated talent pool that mitigates hiring challenges.

Natalie Holder, Liz Hoffman, Julianna Fessenden,
Jao van de Lagemaat, Stephen Smith, Tracy Spooner

RECRUITING AS A NATIONAL LAB

PROBLEM & OPPORTUNITIES

- Women comprised **32%** of senior leadership and historically underrepresented employees (HUEs) accounted for only **9.5%** of these roles
- The Labs face low applicant flow, relative unfamiliarity with the National Lab complex amongst available candidates, competitive compensation packages across industries, and many issues connected to geography that hinder successful recruiting
- All National Labs are required to address recruiting & hiring in their PEMP analysis – opportunity to improve hiring 17x by utilizing universal practices

CREATE & MANAGE A SHARED RESUME BANK

COMPONENTS

After a lab fulfills a job requisition and onboards a candidate, the resumes received during the search would be deposited into a repository from which other national labs could search for talent

BENEFITS

- Taps into talent already interested in working for a national lab
- Increases applicant flow
- Decreases post-to-hire periods

OPPORTUNITY

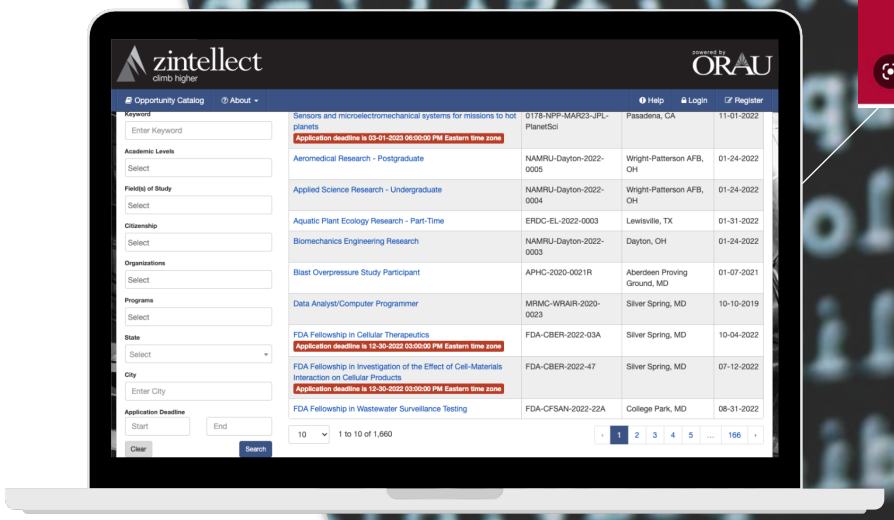
Many labs have similar job functions providing an opportunity to cross-pollinate applicants

SOLUTION

EXPLORING ZINTELLECT

Zintellect can be customized to fit what TOP needs:

- Allows hiring managers the ability to filter the resumes in the database based on education, job experiences, and a host of other categories to make the resumes easier to categorize and evaluate
- The platform provides everything from AI classification and ratings of resumes and candidates, to systems that allow multiple individuals to look at applicants
- Full-service, automated system, eliminating the need for a recruiter or hiring manager to drive the resume submission process



TUSKEGEE UNIVERSITY

NEXT STEPS & RECOMMENDATIONS

REVIEW & DISCUSSION > CREATE WORKING GROUPS > PROJECT MANAGEMENT

Convene the NLCHROs, the NLCDOs and the team at Zintellect to meet to further discuss TOP and determine a path for implementation

Develop a set of working groups to focus on implementing different areas of TOP, meeting on a consistent basis to determine progress

Create a system that would hold the planning committee accountable for targeted deadlines and tasks

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Forrestal, Washington, D.C.

System Innovations in Benefits

Kathryn Mohror (lead, LLNL), Julianna Fessenden (LANL), Simerjeet K Gill (BNL), and Jao van de Lagemaat (NREL)

View White Paper

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SYSTEM INNOVATIONS IN BENEFITS

Kathryn Mohror, LLNL
Julianna Fessenden, LANL
Simerjeet K Gill, BNL
Jao van de Lagemaat, NREL

National labs face significant challenges in recruiting and retention

- National labs cannot match salaries offered by competitors
- Workers want more incentives and greater work flexibility in the post-covid market
- **Labs need to be more competitive and creative in benefits offerings**

Our recommendations

1. Improve awareness of current benefits

2. Alter current policy and contractual limitations on benefits

3. Establish a system-wide HR vendor that can provide benefits offerings to all laboratory staff

Recommendation 1: Improve awareness of current benefits

- Establish a communication campaign to inform employees of existing benefits
- Rework HR websites to advertise benefits clearly
- Highlight lesser-known benefits in internal lab news or social media
- Train managers to raise awareness of benefits with their teams

Impact	Lab staff will feel more valued

Recommendation 2: Alter current policy and contractual limitations on benefits

- Remove or reduce DOE policy and contractual limitations on benefits, give LDs as much flexibility as possible
- Charter a working group to provide recommendations
- Establish a pilot at one or more labs to demonstrate viability of approach

Impact	LDs can quickly pivot to meet workforce needs

Recommendation 3: Establish a system-wide HR vendor

- Opt-in strategy for labs and employees
- Labs can continue to offer benefits not available from system-wide vendor, e.g., a pension plan
- Features
  - Enables transfer of leave accrual and retirement plans
  - Provide perks after employment ends

Impact	Wider variety of benefits at a lower cost

Synergistic Approaches

- Laboratory Operations Board HR Toolkit Working Group seeks to change policy and contractual limits on benefits changes
- Battelle is considering a workforce initiative across Battelle-managed laboratories to make it easier for staff to move between labs without affecting benefits
- Office of Personnel Management offers a wide array of health insurance packages and transferrable benefits

We need a systemic restructuring of benefits offerings at the national labs

Next Steps

- Make systemic change to benefits offerings a priority for lab leadership
- Task the LOB HR Toolkit Working Group or other group to pursue our recommendations

Thanks to all who helped us!

- Mark Peters, Executive Vice President for National Laboratory Management & Operations at Battelle
- Kim Budil, Laboratory Director, Lawrence Livermore National Laboratory
- Jack Anderson, Lead, Laboratory Operations Board HR Toolkit Working Group
- Laboratory Operations Board
- LLNL, LANL, NREL, SNL HR staff

Questions?

1. Improve awareness of current benefits
2. Alter current policy and contractual limitations on benefits
3. Establish a system-wide HR vendor that can provide benefits offerings to all laboratory staff

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Forrestal, Washington, D.C.

Ensuring a Diverse, Equitable, and Inclusive Operations and Research Culture Across the National Laboratory Complex

Kate Anderson (NREL), Sanjaya Senanayake (BNL), Tracy Spooner (PNNL), Laura Stonehill (LANL), Francesca Toma (LBNL), and Robert Wagner (ORNL)

View White Paper

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Fostering **a DEIA** Research & Operations ***Culture*** across the National Laboratory Complex

Kate Anderson
National Renewable Energy Lab

Sanjaya Senanayake
Brookhaven National Lab

Francesca Toma
Lawrence Berkeley National Lab

Tracy Spooner
Pacific Northwest National Lab

Laura Stonehill
Los Alamos National Lab

Robert Wagner
Oak Ridge National Lab

Oppenheimer Science and Energy Leadership Program
Cohort 5 | 2022

Innovation is born from diversity and inclusion

diversity, equity, inclusion, and accessibility is foundational to the success of the lab complex

JUSTICE40

A WHOLE-OF-GOVERNMENT INITIATIVE

U.S. DEPARTMENT OF ENERGY | Office of Science

SC Diversity, Equity & Inclusion Initiatives

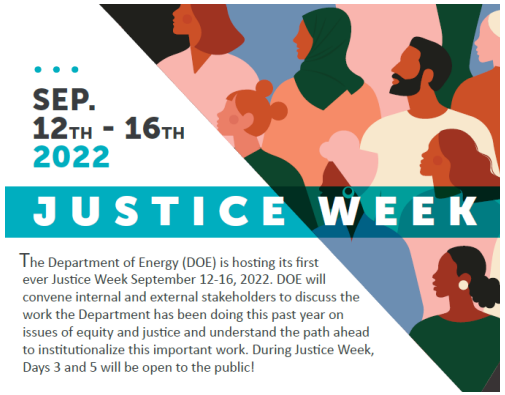
Administration Priorities COVID Plan

FACT SHEET: President Biden Signs Executive Order Advancing Diversity, Equity, Inclusion, and Accessibility in the Federal Government

JUNE 25, 2021 • STATEMENTS AND RELEASES

Today, President Biden signed an Executive Order to advance diversity, equity, inclusion, and accessibility (DEIA) in the Federal workforce. This Executive Order reaffirms that the United States is at its strongest when our Nation's public servants reflect the full diversity of the American people.

Even with decades of progress building a Federal workforce that looks like America, the enduring legacies of employment discrimination, systemic racism, and gender inequality are still felt today. Too many underserved communities remain under-represented in the Federal workforce, especially in positions of leadership. This Executive Order establishes an ambitious, whole-of-government initiative that will take a systematic approach to embedding DEIA in Federal hiring and employment practices.



Why now?

"When you hear President Biden say he wants to build a better America…

he means a more equitable America.

A more inclusive America.

A more just America.

And we'll build it with clean energy."

– U.S. Department of Energy Secretary Jennifer Granholm

What can we learn from safety *culture*?

Who we met with:

NLDC Chief Diversity Officers

Laboratory Operations Board

Lady Idos
Head of the DOE Office of Diversity, Equity, Inclusion, and Accessibility

Shalanda Baker
Director of the DOE Office of Economic Impact and Diversity

Julie Carruthers
Office of Science Senior Science and Technology Advisor on Equity

OSELP cohort members

Recommendations

1. Develop lab complex DEIA community standards and best practices
2. Expand lab complex diversity metrics to track progress over time and incorporate measures of inclusion
3. Integrate DEIA and energy justice into our daily research and operations work

1 DEIA Community Standards

Everyone is personally responsible for ensuring DEIA in research and operations

Leaders value the DEIA legacy they create in their institution

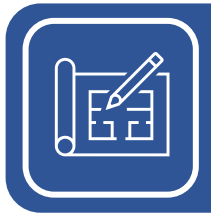
Staff raise DEIA concerns because trust permeates the organization

Cutting-edge sciences requires diversity of thought

Foster a respectful and psychologically safe work environment

A DEIA culture of respectful learning and continuous improvement is encouraged

DEIA is evaluated and measured for every project, every time



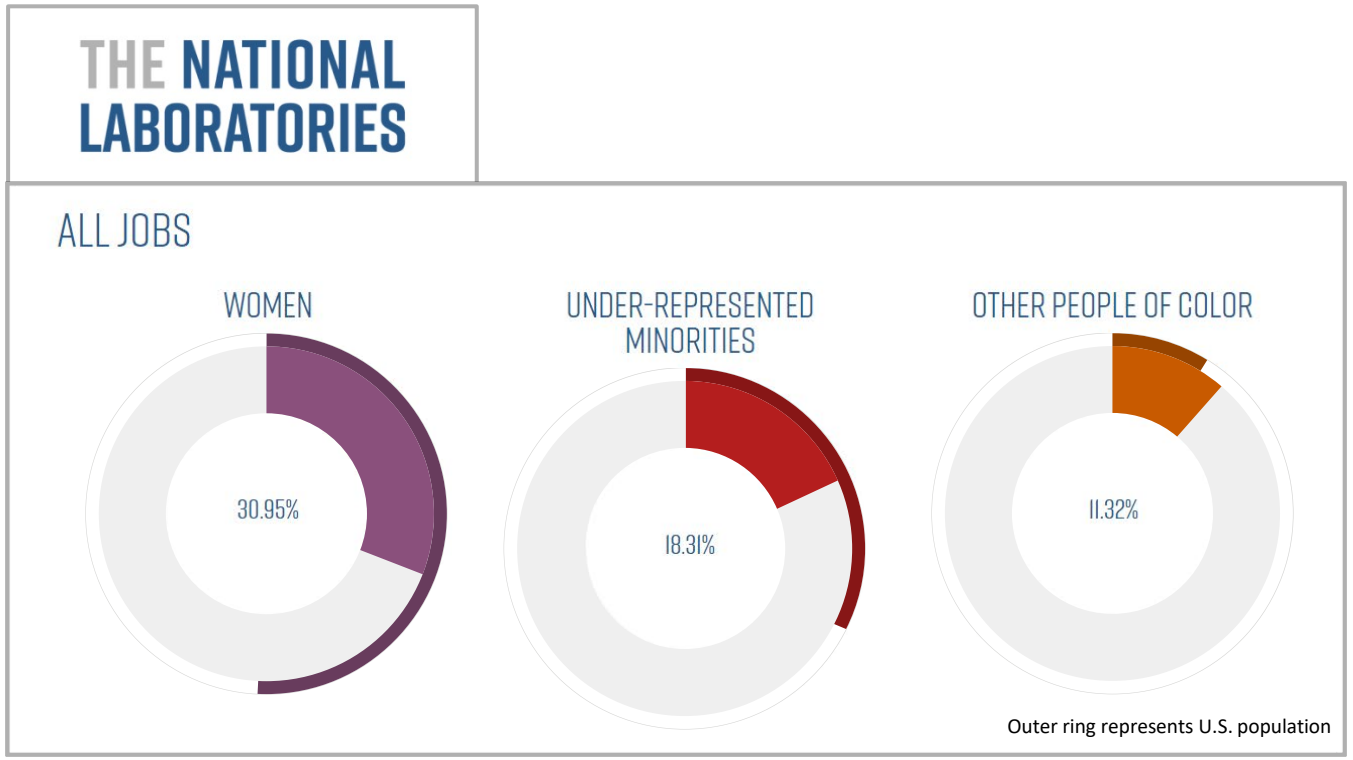
DEIA is purposefully built into research and operations design

2 Track progress over time and add inclusion metrics through annual climate surveys

Annual climate survey

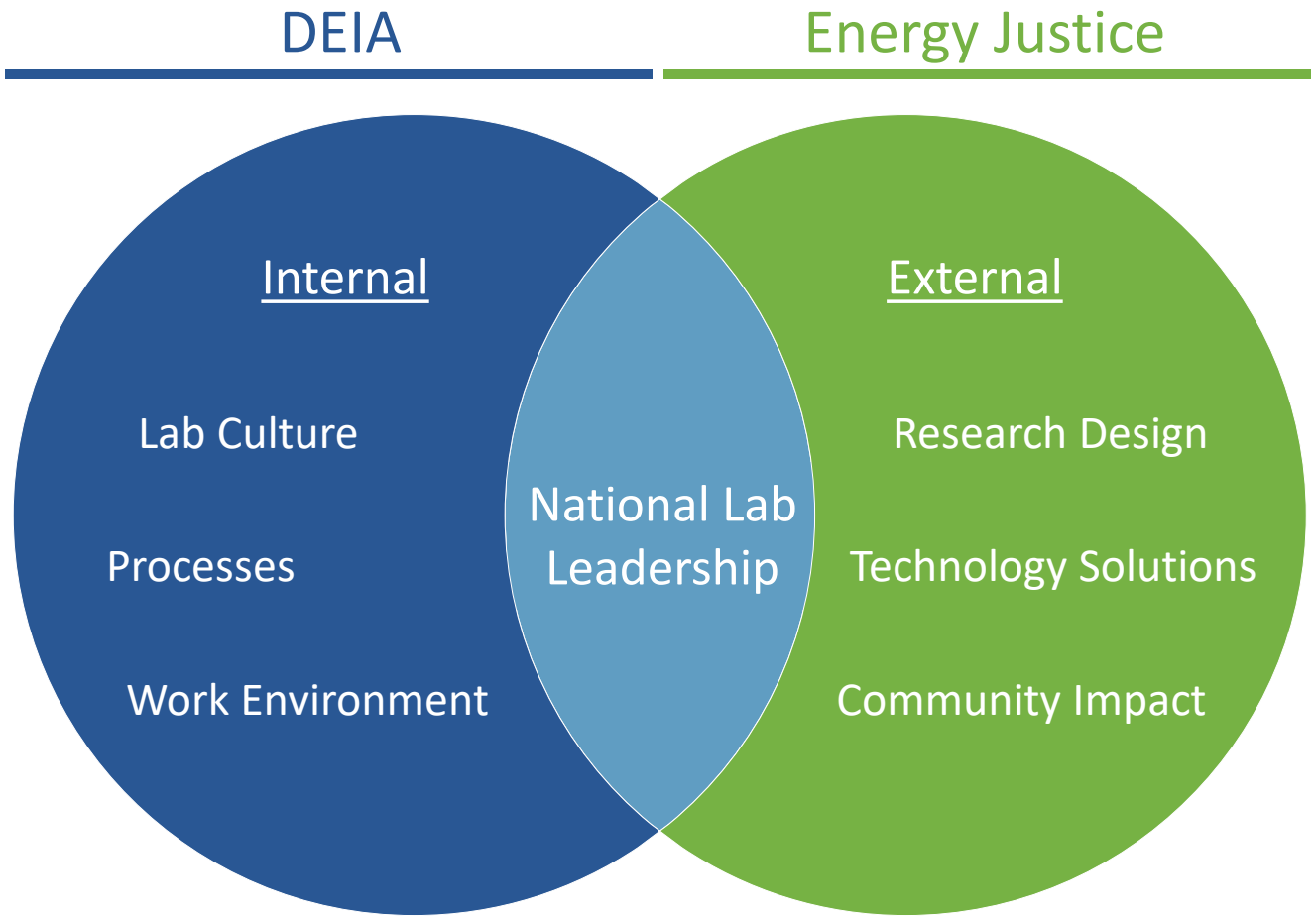
Inclusion metrics

Longitudinal metrics to track progress



Diversity and inclusion data from the National Laboratory Director's Council website

3 Integrate DEIA and energy justice into our daily research and operations work



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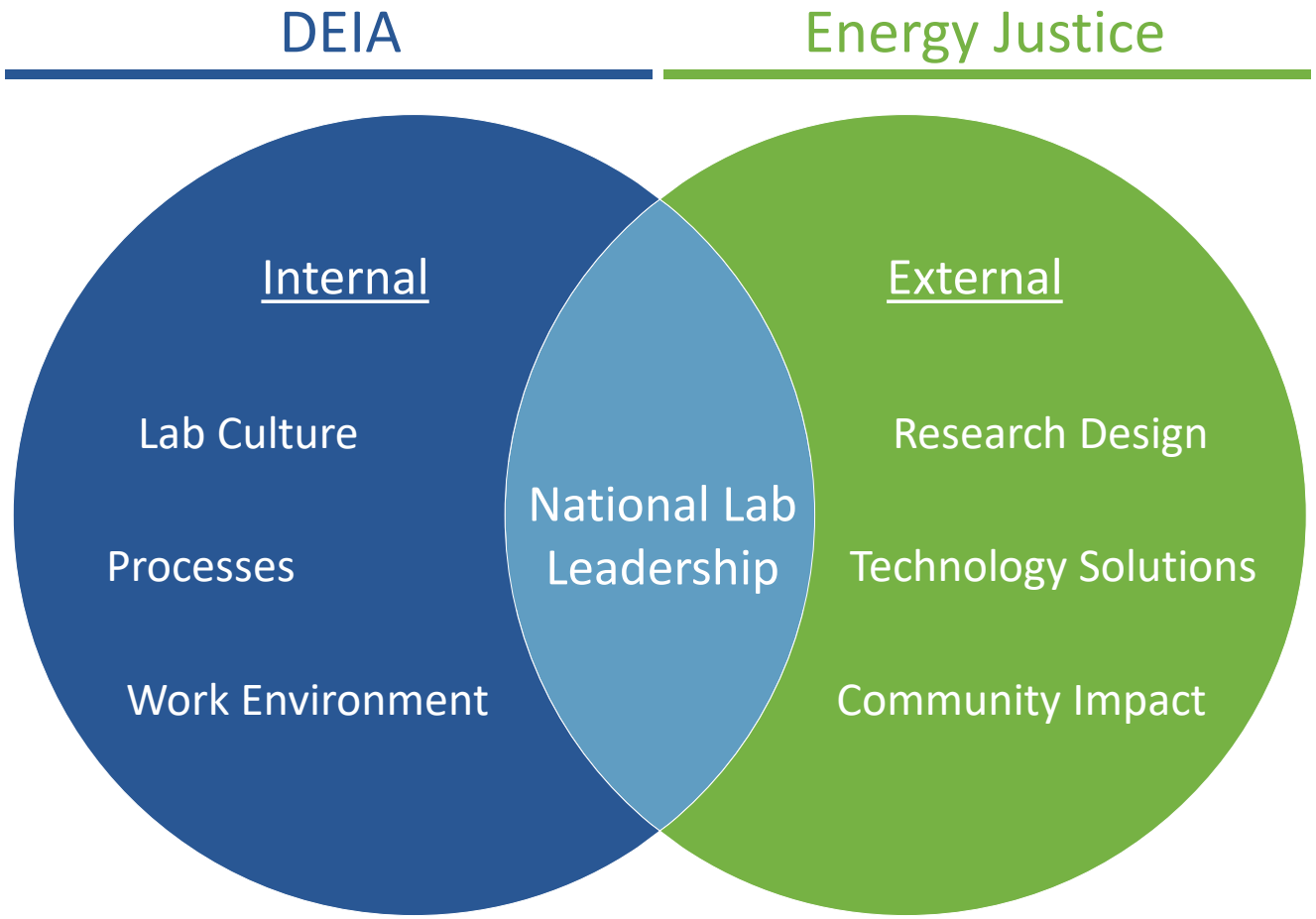

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Questions?

OPPENHEIMER SCIENCE AND ENERGY LEADERSHIP PROGRAM

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Innovation for Global Security

Dave Brannegan (ANL), Simer Gill (BNL), Kathryn Mohror (LLNL), Ryan Ott (Ames), Bill Pike (PNNL), Jao van de Lagemaat (NREL), and Ram Devanathan (PNNL)

&

Accelerating Innovation Through Multi-Lab LDRD Investments

Bill Pike (PNNL, co-lead), Julie Carrera (ANL, co-lead), Chelsey Aisenbrey (Ames), Mei Bai (SLAC), Ahmed Diallo (PPPL), Matt Garrett (SLAC), Jonathan Russell (SLAC), Laura Stonehill (LANL), and Francesca Toma (LBNL)

This think-piece presentation combines two think-pieces: Innovation for Global Security and Accelerating Innovation Through Multi-Lab LDRD Investments.

View Global Security White Paper

View Multi-Lab LDRD White Paper

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Accelerating Innovation in the Laboratory Complex

GSI

Global Security Innovation

Dave Brannegan (ANL), Simer Gill (BNL), Kathryn Mohror (LLNL), Ryan Ott (Ames), Jao van de Lagemaat (NREL), Ram Devanathan (PNNL)

LDRD

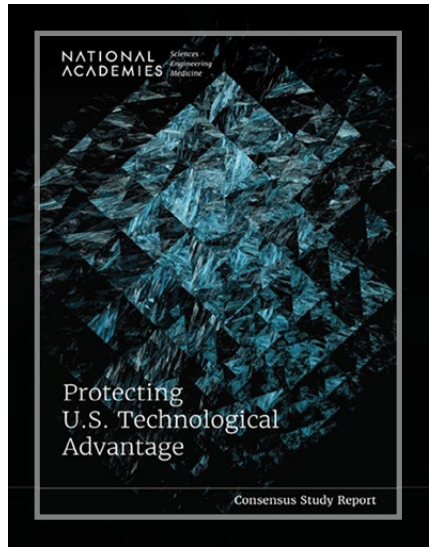
Multi-Laboratory LDRD

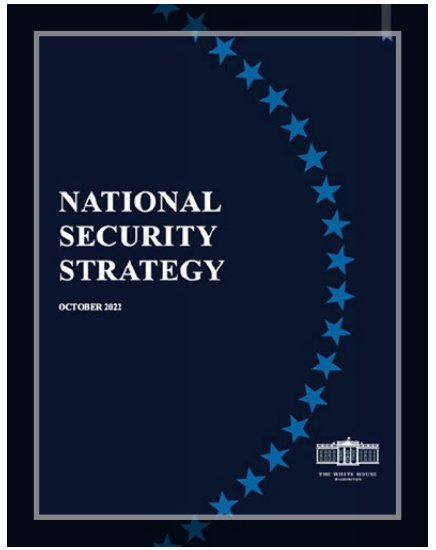
Chelsey Aisenbrey (Ames), Mei Bai (SLAC), Julie Carrera (ANL), Ahmed Diallo (PPPL), Matt Garrett (SLAC), Bill Pike (PNNL), Jonathan Russell (SLAC), Laura Stonehill (LANL), Francesca Toma (LBNL)

Need:

Enhance the ability of the Lab Complex to increase collective innovation in key areas

- Opportunities for greater collaboration
- Imperative to accelerate US innovation
- Technological and adversarial changes require new approaches
- More diverse partnerships for incubating critical technologies





Urgent Global Security Challenge

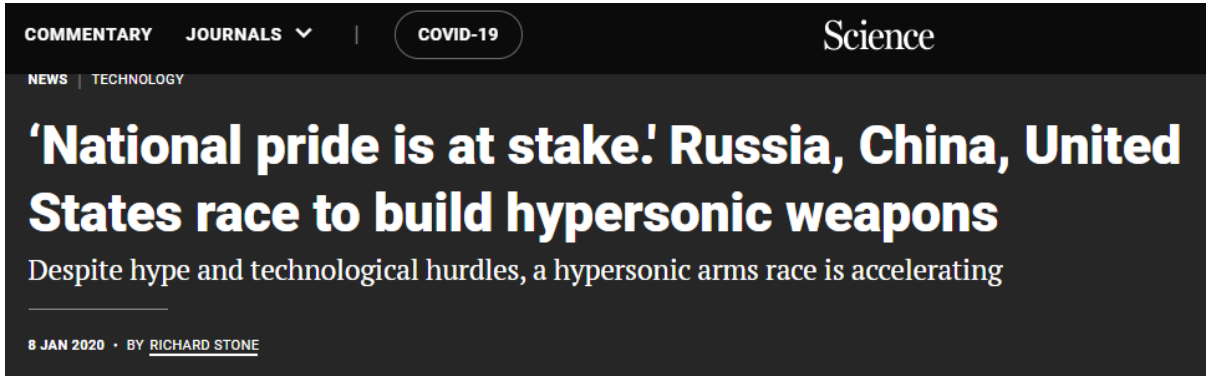
- New era of great power conflict and threats
- Adversaries on pace to surpass U.S. innovation in many critical areas
- The Lab system must accelerate:
  - Anticipating threats over the horizon
  - Adopting innovative ideas in emerging technologies
  - Attracting new staff to national security work
  - Strengthening system as a national security asset

> We face a global struggle of indeterminate duration against two great powers… They are challenging us not only militarily but also in their use of other instruments of power—development assistance, strategic communications, covert and other influence operations, and advances in cyber and other technologies.

Robert M. Gates
Washington Post
March 2022

Our Proposal

- Build communities of practice to anticipate and counter threats and advance emerging technologies
- Convene annual Gordon Conference-like workshop for the community to exchange ideas
- Sustain diversity of thought beyond what a single lab can achieve
- Incubate strategic partnerships for readiness
- Excite and engage a technically diverse workforce in national security work


COMMENTARY JOURNALS | COVID-19 Science

NEWS | TECHNOLOGY

'National pride is at stake.' Russia, China, United States race to build hypersonic weapons

Despite hype and technological hurdles, a hypersonic arms race is accelerating

8 JAN 2020 • BY RICHARD STONE

Global Security Recommendations

- Identify emerging challenge areas with NLDC endorsement and NLCRO input
- Organize inaugural workshop with OLN and NL experts on mechanism and scope
- Obtain direct funding or coordinate LDRD investment by labs
- Gather community at annual workshop
- Transition to sponsor funding and sustain the community

Launching a Systematic Approach to Coordinated Multi-Lab LDRD

- Institute an annual planning process to identify strategic investment themes
- Facilitate diverse team formation across basic and applied labs
- Surface new combinations of capabilities to accelerate innovation
  in the national interest
- Enable labs to opt-in to multi-lab teams using their own LDRD funds

LDRD

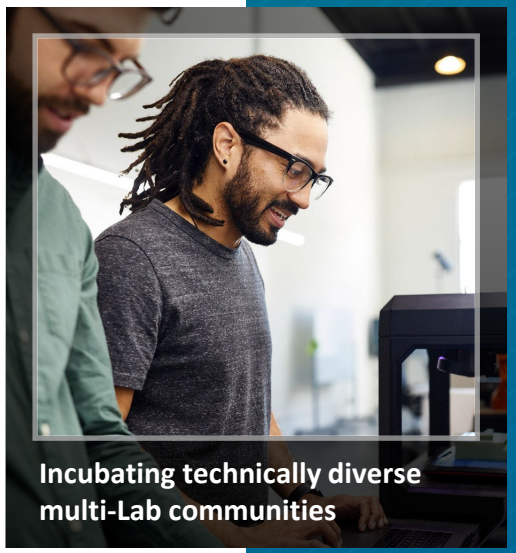
LDRD program managers and DOE-SC are supportive and ready to work out implementation of a multi-lab LDRD program.

CLIF Cross-Laboratory Innovation Federation

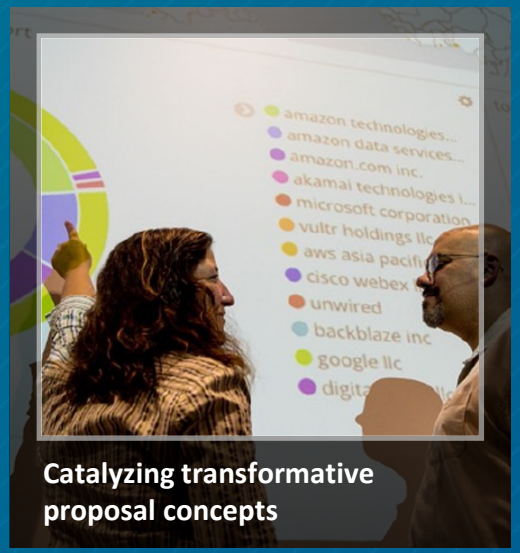
CLIF Recommendations

1. Establish an annual planning process to identify candidate strategic themes
   - **Charter a cross-lab organizing committee to develop candidate themes**
   - **May delegate to OLN**
2. Launch a pilot multi-lab investment based on an NLCRO-endorsed theme
   - **Organizing team runs project scoping event**
   - **Review committee recommends at least one project to pilot involving 3+ labs**
3. Support LDRD Program Managers in creating a governance structure
   - **Administrative implementation will be specified by LDRD program manager team**

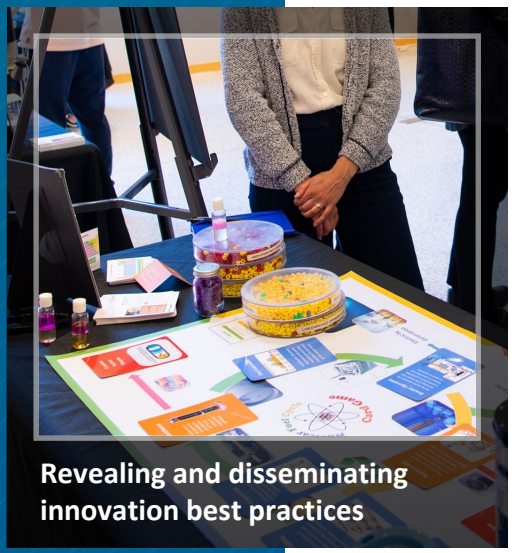
GSI and CLIF will elevate the impact of the National Lab System



Incubating technically diverse multi-Lab communities



Catalyzing transformative proposal concepts



Revealing and disseminating innovation best practices

Enhancing mission commitment

Demonstrating to stakeholders that the system is more than the sum of its parts

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Overcoming Barriers for a Modern, Net Zero Carbon National Laboratory Infrastructure

Ahmed Diallo (PPPL), Jamie Dunlop (BNL), Brian Egle (ORNL), Matt Garrett (SLAC), Catherine Hurley (ANL), Christine King (INL), Jao van de Lagemaat (NREL), Julie Mitchell (ORNL), and Ryan Ott (Ames)

View White Paper

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Overcoming Barriers for "Net-Zero" Modernization of National Laboratory Infrastructure

Ahmed Diallo (PPPL), Jamie Dunlop (BNL), Brian Egle (ORNL),
Matt Garrett (SLAC), *Catherine Hurley (ANL)*, Christine King (INL),
Jao van de Lagemaat (NREL), Julie Mitchell (ORNL), Ryan Ott (Ames)

National Lab Infrastructure is Threatening DOE's Mission

Current challenges facing the national laboratory infrastructure:

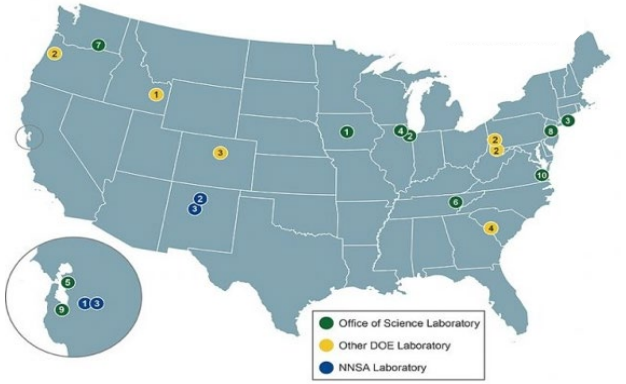
$4.3B Deferred Maintenance

Growing Needs

- Significant maintenance and repair backlog
- Lack of modern, flexible and resilient facilities
- Large energy use and carbon footprints

Lack of unified vision and plan

- Separate infrastructure plans for each National Lab
- Lack of compelling vision and message for National Lab modernization



Limited Funding

- Insufficient appropriations
- Competition for lab overhead
- Limited use of non-appropriated funds


GAO
Accountability·Integrity·Reliability
Highlights
Highlights of GAO-05-55, a report to the Chairman, Committee on the Budget, U.S. Senate

December 2004
CAPITAL FINANCING
Partnerships and Energy Savings Performance Contracts Raise Budgeting and Monitoring Concerns

Laboratory Infrastructure: Why This and Why Now?

Retaining the Best and Brightest

Scientists and engineers are attracted to modern lab space which meet their future ambitions. The rise of Alphabet, Meta, Tesla and Apple labs are providing greater options for scientific and engineering talent than ever before.

Near-Peer Adversaries

China is expanding and modernizing their national laboratory system* on a scale which has the potential to dwarf and surpass US scientific and technological leadership.

Economic Impact

The creation of jobs supporting this modernization, from facility construction to suppliers of technology which lower the carbon footprint of the laboratory, would be substantial.

*https://www.popsci.com/chinas-launches-new-quantum-research-supercenter

Address Key Barriers Hindering Long-Term Modernization

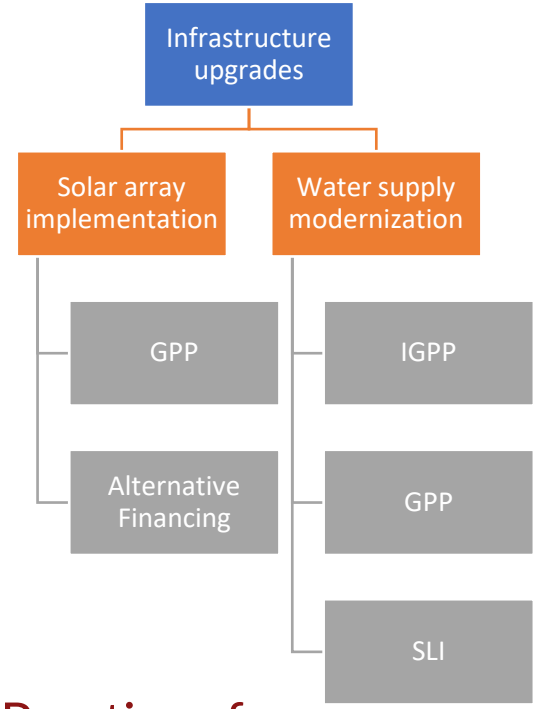
BARRIERS	PROPOSED SOLUTIONS
Significant Policy and Regulatory Barriers Which Slow the Pace of Laboratory Modernization	Refine the Policy *Change the rules of the game*
Selling the Need to Congress and Key Stakeholders Has Been a Challenge	Unified Vision and Plan *Create an image of what the labs could become*
The Contractual Tools to Enable Energy Efficiency and "Net Zero" Are Complex and Not Easy to Use	Enhanced Collaboration *Work together to move the needle and solve problems*

Refine The Policy: Towards New Paths for Success

Source: National Cancer Institute.

Establish committee (FACA) or working group (FACA subcommittee/working group) for DOE Laboratory Infrastructure Modernization.

- alternative financing mechanisms
- new policy directives,
- expert, consensus-based implementation guidance.



"Swiss Army Knife": Best Practices for Financing Lab Infrastructure Modernization.

DOE-approved, detailed toolset for funding/financing laboratory infrastructure modernization

Unified Vision: The Orbach Report for Lab Infrastructure

Create a 20-year vision ”Infrastructure Modernization for the Future of the National Laboratory System”

- Consistent Message
- Comprehensive Assessment
- Long-Term Roadmap
- Vision to Rally Around and Sell to Stakeholders

Enhanced Collaboration: Building Tools for Modernization

NET ZERO LABS

U.S. DEPARTMENT OF ENERGY

Develop a Community of Practice for Energy Service Agreements

- Link up National Lab staff and DOE Contracting Officers
- Share best practices, lessons learned
- Accelerate adoption of ESA's for modernization

Establish a NLDC Net-Zero Lab Infrastructure Committee

- Connect National Lab leaders working on net zero labs
- Focus on critical path items for campus modernization needed to achieve net zero

The Ask for the NLDC: Laboratory Modernization

Solutions	Requests
Refine the Policy *Change the rules of the game*	**NLDC convenes a summit on National Laboratory Modernization.** Recommendations generated from workshops held during this summit are integrated into white papers used for policy change advocacy. Members of OLN could organize, steer and participate
Unified Vision and Plan *Create an image of what the labs could become*	Workshop during summit generates ideas which could be incorporated into 20-year vision. Submitted to the LOB or other FACA-affiliated committee
Enhanced Collaboration *Work together to move the needle and solve problems*	**NLDC convenes a Net Zero Laboratory Infrastructure Committee.** Focus on collaborative aspects of the recommendations, including ESAs and developing actionable net-zero carbon infrastructure plans for the labs.

What Success Could Look Like: US Army Corps of Engineers for Water Infrastructure

Photo: Fargo-Moorhead Flood Risk Management project; estimated federal cost savings from public-private partnership: $100M

- The 2014 Water Resources Reform and Development Act (WRRDA) authorized USASCE to "*establish a pilot P3 program ... to carry out authorized water resources development projects...*"
- Director of Civil Works at USACE signed implementation guidance in 2019 for up to 15 P3 projects.
- **USACE and DOE appropriations and oversight in the Senate is through Energy and Natural Resources committee**

Interviewees and Forums for Think Piece Refinement

Michael Brandt – LBNL Deputy Lab Director for Operations

Jeff Smith –former Deputy Lab Director for Operations at ORNL; former board member of TVA

Jimmy Stone – Director of Facilities and Operations at ORNL

Professor Sidney Shapiro (Wake Forest University School of Law) - expert on FACA; Congressional testimony on FACA updates in 2005.

Michael Bennon (Freeman Spogli Institute, Stanford University) domestic and international infrastructure modernization financing

Laboratory Operations Board – August 2022

OPPENHEIMER SCIENCE AND ENERGY LEADERSHIP PROGRAM

Cohort 5 Think-Piece Report, 2022

www.oselp.org